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# California State Journal of Medicine

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## CONTENTS.

Editorials ..... 131

Medical Preparedness ..... 136

Some Epidemiologic and Bacteriologic Observations on Paratyphoid Infections in California. By K. F. Meyer, M. D., and J. E. Stickel.... 139

Sanitary Service of War and the Demobilization Period. By Captain Ralph G. De Voe 146

Is Acute Anterior Poliomyelitis Spread by Direct Personal Contact? By J. C. Geiger, M. D. .... 150

The Fallacy of Post-Vaccination Tetanus Due to Vaccine

(Contents continued on page IX.)

Virus. By J. C. Geiger, M. D. .... 152

Death Due to Status Lymphaticus Following an Injection of Diphtheria Antitoxin. By Wm. C. Hassler, M. D.. 153

Typhus Fever in California. By Jas. G. Cumming, M. D. 154

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(*Sarah Morris Memorial Hospital for Children*)  
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A DISCUSSION OF PERICARDOTOMY BY DR.  
KELLOGG SPEED.HEMORRHAGIC PERICARDITIS, WITH ACUTE SEPTIC  
ENDOCARDITIS.

SEROFIBRINOUS PERICARDITIS.

Clinic of Dr. Herman L. Kretschmer, *Presbyterian Hospital*FULGURATION TREATMENT OF BLADDER PAPILLO-  
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THE INTESTINES.

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MAY, 1917

No. 5

### MOBILIZATION OF MEDICAL RESOURCES.

The United States of America is at war with Germany. The medical profession stands, as always, ready and willing to do its full share of duty. Up to the time of writing (April 16) there has been no clear declaration of what is wanted, no statement concerning the manner of mobilization of the potential medical power of the country. In another column we publish the scheme of the Council of National Defense. This outline should be studied and thoroughly understood by each and every reader of the Journal. It is the means by which the central authority will be enabled to use the capacity of the individual physician to the utmost. The State Committee of the Council of National Defense has a list of names of physicians which it was able to gather many months ago, when the need for the services of all was not pressing, or at least was not understood by the profession to be pressing, and which represents but a small portion of the available medical force which can be used when the country needs it. It consists of the few who *stated* at that time that they were at their country's call, but not of the many who, when the need is at all apparent, are just as ready to serve. The greater part of the profession is in the dark as to just what is wanted of it. It does not know just what to do.

We would urge upon our State Committee of the Council of National Defense that it classify in a scientific manner, which means in a way

available for use, the *entire* medical profession of the state with respect to the work for which each man is best fitted, so that when he is called upon to volunteer or is drafted, he can serve the nation in his fullest measure; so that each unit of the army will have its proper proportion of sanitarians, internists, surgeons, aurists, oculists, dentists, other specialists, and even chiropodists. No detail should be neglected which will give to the men in the field and training-camp, and to that portion of the population remaining at home the best possible care. The Army and the Navy and the Red Cross and the Council of National Defense should work so in harmony that when assignments of men are to be made, the lists of the Council should determine who is the very best man for the position in question and any assignments should immediately be reported to the Council so that its lists will always be up to date. There should be not even a chance of a repetition of such mistakes as were made in the Spanish-American War, when, for instance, one of the most noted public hygienists in the United States was put to doing surgery, and, *after the war*, was a member of the Committee to determine why there was so much typhoid fever in the army-camps.

It is against the policy of the Journal to mention the name of any commercial organization in its editorial columns, but we shall, as a matter of public necessity, be inconsistent. There is available, in the Medical Addressograph Service in San Francisco, a fairly complete classification of the physicians of all schools, licensed to practice the healing arts in the state. This service has the men grouped both geographically and according to specialties, so that it may well serve as a basis upon which the Committee can begin its task. Such a classification by the State Committee, supplemented by lists from the County Committees in which *all* the medical capacity is classified, will be worth while. It is not necessary to know alone who is best fitted to go to the front, but also who is best fitted to work at home. Age, health, dependents and numerous other factors should be taken into account, besides medical fitness.

But all of this work depends upon local funds, so that each county society should immediately appropriate some money for this purpose. Let each society finance its own County Committee and send an adequate sum for the use of the State Committee. The Council of the State Society should appropriate a sum for the work of the State Committee.

In the meanwhile every unattached, unmarried physician under the age of forty-five upon whom the support of others does not depend should immediately join the Officers' Reserve Corps both to minimize the difficulty of recruiting reserve officers, and because immediately camps are established, large numbers of physicians will be necessary. This applies particularly to recent graduates.

The medical profession of the State of California is behind the President and is ready to do its duty.

### DIVISION OF FEES.

A retired physician, who is now actively engaged as a banker, in relating to the writer of these paragraphs that the people of his town had so much confidence in him that "nothing big could come off" (note the language of the counting house) in a medical way unless he were consulted, went on to say that he rarely charged for this consultatory service because most of the townsmen were old friends of his. And then he went on again, in the most casual manner, and made the astounding statement that there were no capable surgeons in his town, and that he sent all the surgical cases he could to "the city," and that the city surgeon sent him half the fee, and that he was thus able to "*pick up a couple of thousand a year.*"

When taken to task, he offered the argument that he had nothing whatever to do with the transaction. The surgeon makes his own price for the services, collects the money and, with no solicitation on the part of the "banker-doctor," sends him half. The "banker-doctor" says that it is none of his business if the surgeon is willing to present him with half his earnings.

He was not alone unwilling, but definitely objected to have the transaction characterized in the plain Anglo-Saxon terms, dirty and crooked. He vigorously maintained that his skirts were clean, and that his patients were not in any sense mulcted. *But he refused to reveal the name of the surgeon!*

Do you see the point? Is it necessary to lead you to the moral? Isn't it as plain as the nose on your face? Is it right?

### THE THOUGHTLESS DOCTOR.

It seems to make no difference how often commonplace advice is repeated; every so often it requires re-statement. The Journal has called attention again and again to the number of malpractice suits arising from a thoughtless statement of a physician. Given such a statement, an ignorant or malicious patient, and a shyster lawyer, a malpractice suit follows as a matter of course. Most of the trouble arises from patients who migrate from doctor to doctor, picking up fragments of statements as they migrate. Of course, most of these suits are groundless and are dropped, but they are nevertheless a burden upon the budget. Many of our recent suits have arisen in just this way. This matter is a straight dollars and cents proposition. Every one of these suits, unfounded as they are, costs so much money for legal services. In the aggregate they are sufficient to increase or decrease the amount of your premium.

It is not alone a duty, but a pleasure, for the Society to defend members in malpractice suits, but it does hurt to see its funds depleted and diverted because one of its members has said something that he really did not mean.

### THE LEGISLATURE AND MEDICINE.

At the time of writing the State legislature is still in session and will be for about two weeks. As usual it has had various medical problems to consider and it can be said that up to the present time it has, on the whole, done well. It must be remembered that the average senator and assemblyman has no desire to see vicious or undesirable legislation passed. He wants to be advised, but unfortunately the great bulk of the medical profession is apathetic and does nothing, and the most pressing and compelling advice comes from those interested in vicious medical legislation. Naturally when a legislator receives numerous urgent requests for certain action in matters pending and there is little or no objection to the same he is very much inclined to consider the former as "a request from the people," and act accordingly. Bear this in mind please, those of you who do nothing until the fight is all over and then attempt to criticize. The California State Medical Society ought to develop and exert its political strength more forcibly. With almost 5000 regular practitioners in California and only about 1000 osteopaths and about 130 drugless healers, it will be seen that the representatives of different freak cults have political influence all out of proportion to their numbers. It is humiliating to realize that this is the case. It need not be any longer if we will only exert ourselves. Now is the time to get ready for the next legislative session two years hence. Interview your present senators and assemblymen and later on their successors and have them promise to consult you in regard to medical legislation.

### RADIUM.

Local physicians have purchased during recent months quantities of radium element aggregating 250 milligrams for use in their respective practices. This radium is mounted in various types of applicators designed for Dermatological, Gynecological and Surgical uses.

The United States Bureau of Standards at Washington provides for the measurement of radium expressed in terms of actual radium element contained, and issues certificates based on the International Radium Standard.

The present market price of radium is \$100.00 per milligram. There is a strong probability, however, that the great advance in the costs of production, chemicals and laboratory equipment, will sharply affect radium production, and an early advance is inevitable.

Radium is extracted from uranium ores, large deposits of which are found in Colorado. It is from this source that the main supply is obtained

commercially. To produce one gram of radium element from 400 to 800 tons of carnotite ore must be treated. About 700 tons of chemicals are required for the extraction of one gram of radium.

The quantity of radium employed in the treatment of malignant conditions ranges from five milligrams to one hundred milligrams and upward. For dermatological uses quantities of from five to twenty-five milligrams are employed. In gynecological and surgical conditions from twenty-five milligrams upward are required. The dosage depends upon the nature of the lesion and its location. When larger quantities of radium are employed the exposure may as a rule be correspondingly shortened. The half-life period of radium is 1780 years.

During the Detroit meeting of the American Medical Association last year the American Radium Association was formed for the scientific study of radium and its uses. This organization will hold its next meeting in New York during the week of the American Medical Association Convention.

#### HEALTH INSURANCE.

If the enabling amendment proposed by the Social Insurance Commission of the State of California goes through the legislature (at this writing it has passed the Senate with every likelihood of receiving a majority in the Assembly), the people will have to decide for themselves as to whether they wish to endorse the principle of health insurance. If they do, we shall be asked to give our services to that class of individuals coming under the act, our organization, fees, etc., to be fixed by law.

If, as we are told, health insurance must come, there are certain fundamental principles, which we think should be impressed upon the minds of every person thinking or talking health insurance.

The cost should be borne partly by the employer, if there be one, partly by the employee, and partly by the State. This is the best way to interest employers in the health of their workers, and to enlist their aid in prevention of disease, for we know that the industry is often responsible for some of the sickness of its employees. The health of employees or their families may be affected by home surroundings, habits, or by the unavoidable incidents of life.

The cost of sickness is not going to be wiped out by health insurance. Its burden is simply going to be shifted. If a man is paid money benefits while ill, for work he is not doing, there is a money loss to someone just the same. But if the worker who ordinarily would have no care, and whose illness would become a serious one, by proper and early care is sick but a short time, there is a money gain to someone, somewhere. And if it is found that to pay physicians and surgeons fees commensurate with their services, is going to make the scheme an expensive one, beyond the means of the three parties who will be asked to contribute thereto, then either the state

must learn that lives cannot be measured by dollars and cents, or it should not engage in health insurance. It is almost pathetic to think that in times of war we are willing to vote for billions for our defense against a foreign enemy, billions for materials which are made but to be destroyed, and yet when at peace, we hesitate to vote a few paltry millions for defense against the enemy who is ever present in our midst: sickness.

The cost is therefore, to our mind, no reason, no excuse for low medical fees. And if we are to have our just dues, we, as citizens, want to deal in these matters directly with the state and not with corporations run for profit, this profit frequently made at the expense of the profession. There are many of us who have complained of the methods of the insurance companies doing industrial accident work. We felt that the State Fund was in a class by itself. But, lo and behold! as a result of its competition with companies run for profit, it too resorted to methods most objectionable to the profession. Without competition, it is claimed, the profession would not have been subjected to the treatment it has received.

Therefore, we object to any bill for health insurance if it does not provide for the exclusion of private companies run for profit, from the field.

Health insurance should not be limited to the man who has a job. Provision should be made to furnish medical care to the unemployed, the shiftless and the pauper. The county now provides for the latter. The state could undertake this and medical men should be paid for service to the indigent as well as to the employed.

But even while considering health insurance, let us see to it that the State give its unqualified support to the State Board of Health in its preventive work. Let us see to it that our housing and factory conditions measure up to the standards imposed by law. And let us try and educate the public to demand only the best medical service, and to appreciate the fact that the best medical service cannot be obtained cheaply, simply by act of legislature.

It is possible that after all, if we are to have health insurance, the best results might be obtained by the universal application to every man, woman or child, whether they pay any part of the cost or not. Cash benefits should be arranged so that only those paying assessments would be entitled to them, or left as now, to existing benefit societies.

It is hoped that the legislature will grant further life to the Social Insurance Commission, with an adequate appropriation to carry on a more intensive study of these matters. R. B.

#### ANNOUNCEMENT.

At its last meeting the Council granted the Publication Committee permission to increase the size of the Journal 16 pages per issue for a limited period. This will relieve the stagnation of papers received and not yet published.

**HENRY LEBER COIT.\***

Men of achievement in medicine are truly rare. It is therefore only fitting when the life's work of one who has truly achieved something fundamental, is ended, that the profession should realize its loss.

In this time of chaos, when life hangs on so small a thread, and men all over the world are dying so that the future may mean more to humanity, it is well to realize that some minds are still devoting themselves to bettering humanity by saving lives.

Such a mind had Henry L. Coit. Graduating in medicine in 1883, he early devoted his time and efforts to the treatment of diseases of infants and children. Laboring as he did in the frightful summers in the East, he early realized that something must be done to stem the ravages of the infantile intestinal disturbances with their frightful mortality. He therefore studied the problem with his highly characteristic force and determination, and reached the conclusion that no single feature was probably playing as great a role in the etiology of Summer Diarrhea as dirty milk.

Only one who has heard Dr. Coit discuss the long and patient struggle that he had to impress upon the profession and the people the importance of his ideas, can realize the stamina and persistency that were necessary to bring his thoughts to a successful issue. In 1893 he formed the first Certified Milk Commission in Essex County, New Jersey, for the purpose of supervising the production of clean milk from non-tuberculous cows.

The profession is accustomed to pass over statements of this type without reflection. How wonderful to have been a man whose mind was keen enough to start a movement that meant the saving of the lives of thousands of infants, and yet how little most of us appreciate the work.

Men like Erlich and Behring die, and beyond a column in the Medical Journal, the world is absolutely ignorant that a genius has passed, and as far as the profession is concerned, a fleeting thought, and the big men are all but forgotten.

Dr. Coit was a man of keen perception and sterling character. His was a life lived strictly by the Golden Rule. In his home he was a kind but firm father, ever thoughtful of those around him, but at the same time, never forgetful of the fact that love must be tempered by judgment.

It was the writer's privilege to know him only during the last few years of his life, but it was indeed a rare privilege. The interest, the solicitude, the enthusiasm for his life work, and above all, for the Certified Milk Movement, were indeed wonderful to behold, and no one could have known Henry L. Coit well without having profited.

The younger members of the profession looked up to him, not only as a man who had truly accomplished something, the value of which was inestimable, but as a true friend to whom they could always go for advice and encouragement, and in turn, his attitude towards them was never

that of condescending seniority, but rather that of a colleague who was ready at all times to receive the ideas of less mature minds and give them reflection and consideration.

Kind, thoughtful, sincere, ever solicitous of the welfare of others, Henry L. Coit died as he had lived, trusting that the work which he had started might go on with unqualified success.

Those of us who knew him shall miss him, but it will always be a source of consolation to his friends that the world was better off because Henry L. Coit lived in it.

**DAY DREAMS.**

It is said that at the Harvard Medical School something like 168 courses are to be had by graduates in medicine each year. The fees accruing from these courses approximate \$10,000. Of this sum \$8,000 is paid in for Dr. Cabot's course in medical diagnostics, while the remaining \$2,000 is contributed by the other 167 courses.

What pleasing day dreams might find harborage in the mind of a megaloccephalic internist did he permit himself to speculate on such a text! How must his vanity expand and sun itself as there appeared before his mental vision the class, mute, pen in hand, note book on knee, leaning forward to catch and record his every word—a whole regiment sitting at his feet,—even as Saul sat at the feet of Gamaliel. The while about him, crook kneed, uncovered, reverential, gather his assistants and associates, each like "Some grave Pachaw at the Prophets' feet Piously licking them, swearing them sweet." Well might he cry, "Ah, sweet, sweet dream, depart not yet from me."

Now the direction of his dream changeth, but not the quality. How profitably might he not thus employ his much too spare time? For in his dream each of the pupils—and their name is legion—is glad to part with much fine gold for the privilege of sitting at the Master's feet. Poor old Get-rich-quick Wallingford, verily thou wouldst waste away with envy—in his dream.

And, still dreaming, how easy it all is of accomplishment. Has he not but to start a new school or to rehabilitate an old one, to name the teachers, announce the courses and let the pupils appear? Of course they would appear—in his dream.

And after all, there is but one essential to the realization of such a scheme. He must be another Cabot—and that's no dream. SNIKTAW.

**THE WAR, MEDICAL CULTS, AND THE LONG-SUFFERING DOCTOR.**

When peace fills the land, how it is the fashion to decry the long-suffering doctor. How he and his works and his ideals are held forth to ridicule and scorn and contumely by the yellow medical press, and newspapers of a kind, and "Life," and all the misguided host of fadism who put their trust in quack, charlatan, -path and -ism. How the Legislature and the City Council and the Congress begrudge him law and money for disease prevention, and for establishment of sane and safe health conditions. How he is execrated, and mis-

\* An Appreciation: San Francisco County Medical Milk Commission.

interpreted, and underpaid, when peace fills the land. Lo, the poor doctor, fool that he is, trying to destroy his own means of livelihood, trying to return public good for private evil, trying to make the preposterous ideal of service in the world, the guide of his daily conduct.

Then see the remarkable effect of war. Forthwith must this same doctor assume as of right, full responsibility for the health and physical efficiency of the fighting man, and the civilian populace alike. He is expected by common consent to meet the emergency at whatever cost of time, livelihood and life may result. And he assumes the responsibility and meets the emergency, going cheerfully and voluntarily into a service which is only less dangerous than the flying corps. What he is expected to do, he does. What he has trained himself to do, he does. His detractors, and critics and enemies in time of peace, expect him to do this and he does it.

But in times of war where are the self-sufficient and highly trained -paths and -isms and fads and cults? Where is the Christian Science medical unit going to the front to care for the wounded? Where is the osteopathic base hospital, and the naturopathic dressing station, and the chiropractic sanitary corps? What a chance for the drugless healers to cure trench foot, and eradicate disease carriers, and prevent camp epidemics. What a chance for the so-called Christian Scientists to show their Christianity in works of relief and mercy, and their science in the care of wounded and sick. What a chance for cult and -ism to prove their mettle, and speak by action. What a chance,—what a rare chance. Yet where are they, when the serious business of war clangs in, to sift the wheat from the chaff, and winnow out the real effectual human service of the physician?

A. C. R.

#### BLINDNESS IN THE UNITED STATES.

The forthcoming report on the blind in the United States announced by Director Sam. L. Rogers, of the Bureau of the Census, Department of Commerce, indicates that 30.8 per cent., or somewhat less than one-third, of the blind population lost their sight when less than 20 years of age (including those born blind); 47.4 per cent., or somewhat less than one-half, during the early or middle years of adult life (from 20 to 64 years); and 21.8 per cent., or a little over one-fifth, in old age (after passing their sixty-fifth year). More persons were reported as having lost their sight when less than 5 years of age than in any other five-year period of life, 16.4 per cent., or about one-sixth, of the total being included in this group; persons reported as born blind formed 6.6 per cent. of the total and persons reported as losing sight when less than 1 year old 5 per cent., these two groups together contributing 11.6 per cent., or more than one-tenth, of those reporting the age when vision was lost.

These statistics are based on an enumeration of the blind made in connection with the census

of 1910. The blind population enumerated was 57,272, and by sending out special schedules through the mails the Bureau obtained data regarding such subjects as the cause of the blindness and the age when it occurred from 29,242 blind persons.

#### SIGNIFICANCE OF THE STATISTICS.

The fact that the 30,000 blind represented in the returns had on the average been blind for 16 years makes plain the gravity of this misfortune. Although the risk of blindness in infancy, childhood, or youth is relatively small, yet, as shown by these figures, the complete elimination of that risk would reduce the blind population by nearly one-third. Similarly, the elimination of the risk of blindness during the early or middle years of adult life would reduce the blind population by nearly one-half, while the elimination of the high risk in old age would cause a reduction of only one-fifth in the number of existing cases. Of course, the earlier the age at which the sight is lost, the greater the magnitude of the misfortune; loss of sight in infancy means a life of blindness, while loss of sight in old age ordinarily means only a few years of that affliction. For this reason the increase in individual happiness and the benefits to society in general that would accrue from a successful campaign against blindness in early life would obviously be vastly greater than would result from a corresponding reduction in the blindness occurring in old age. In this connection it is significant that since 1880 there has been a distinct decrease in the proportion of blind who lost their sight in infancy. In 1880 persons who became blind before completing their first year of life formed 15.3 per cent. of the total reporting, as compared with only 11.6 per cent. in 1910. This decrease is explained largely by the great progress made toward preventing blindness among newborn infants through the use of the Credé method of prophylaxis for ophthalmia neonatorum, which was discovered in 1884.

#### RELATIVE INCREASE OF OCCUPATIONAL BLINDNESS.

The proportion of the blind who lost their sight during the early or middle years of adult life has increased somewhat since 1880. It is probable that this increase is in part the result of the great industrial growth of the United States in the last 30 years, which would naturally bring in its train an increase in the number of cases of blindness due to occupational injury or disease, and hence in the number occurring during the years of economic activity.

A much larger proportion of males than of females lost their sight in the early or middle years of adult life (20 to 64 years of age), the percentage for males being 51.4, or more than one-half, as compared with a percentage of 41.8, or about two-fifths, for females. This marked difference with regard to the period of life when loss of sight occurred is of course the result in the main of the cases of blindness from industrial accidents or occupational diseases, which are numerous among the male blind but are relatively few among the females, and in which obviously

loss of sight occurs for the most part during the early or middle years of adult life.

#### BLINDNESS A BAR TO MARRIAGE.

The statistics as to age at which sight was lost bring out some interesting facts concerning the extent to which marriage takes place among the blind. The majority of those who have not married before they lose their sight continue single for the remainder of their lives. But the fact that the percentage single is higher among the females who lost their sight before the age of 20 than it is among the males indicates that blindness is less of a bar to marriage in the case of males than of females, since, all other things being equal, the percentage should have been somewhat lower for females by reason of the fact that women ordinarily marry earlier than men. The figures show, however, that while marriage is much less frequent among the blind than among those who can see, it is by no means rare; of the males who had lost their sight between the ages of 15 and 19, for example, about one-third, and of the females, about one-fifth, had married since they became blind.

### Medical Preparedness

#### INFORMATION REGARDING THE COR- RELATED ACTIVITIES OF THE COUNCIL OF NATIONAL DEFENSE AND THE ADVISORY COMMISSION, THE MEDICAL DEPARTMENTS OF GOVERNMENT AND THE COMMITTEE OF AMERICAN PHY- SICIANS FOR MEDICAL PREPAREDNESS

Under existing conditions it is desirable that every physician as well as every other loyal citizen of America should be prepared to render active service to the Federal Government, remembering that the protection afforded by the Government has made it possible for its citizens to enjoy liberty, peace and prosperity.

The avenues through which the most effective service can be rendered by members of the medical profession have taken definite and concrete form. Briefly, the plan is that all medical activities should co-operate with the Council of National Defense.

It would seem desirable at this time to state explicitly just what the Council of National Defense and its various agencies are.

The Council of National Defense was created by Act of Congress, August 29, 1916.

Sec. 2. That a Council of National Defense is hereby established, for the coordination of industries and resources for the national security and welfare, to consist of the Secretary of War, the Secretary of the Navy, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, and the Secretary of Labor.

That the Council of National Defense shall nominate to the President, and the President shall

appoint, an **advisory commission**, consisting of not more than seven persons, each of whom shall have special knowledge of some industry, public utility, or the development of some natural resource, or be otherwise specially qualified, in the opinion of the council, for the performance of the duties herein-after provided. \* \* \*

That the Council of National Defense shall adopt rules and regulations for the conduct of its work, which rules and regulations shall be subject to the approval of the President, and shall provide for the work of the advisory commission to the end that the special knowledge of such commission may be developed by suitable investigation, research, and inquiry and made available in conference and report for the use of the council; and the council may organize subordinate bodies for its assistance in special investigations, either by the employment of experts or by the creation of committees of specially qualified persons to serve without compensation, but to direct the investigations of experts so employed.

A committee of distinguished physicians was asked to present to the President, names of medical men suitable for membership on the advisory commission. Dr. Franklin H. Martin of Chicago was selected.

The following statement was issued by President Wilson on the night of October 11, 1916, in announcing his appointment of the civilian advisory members of the Council of National Defense:

The Council of National Defense has been created because the Congress has realized that the country is best prepared for war when thoroughly prepared for peace. From an economic point of view there is now very little difference between the machinery required for commercial efficiency and that required for military purposes.

In both cases the whole industrial mechanism must be organized in the most effective way. Upon this conception of the national welfare the council is organized in the words of the act for "the creation of relations which will render possible in time of need the immediate concentration and utilization of the resources of the nation."

The organization of the council likewise opens up a new and direct channel of communication and co-operation between business and scientific men and all departments of the government, and it is hoped that it will in addition become a rallying point for civic bodies working for the national defense. The council's chief functions are:

1. The coordination of all forms of transportation and the development of means of transportation to meet the military, industrial and commercial needs of the nation.

2. The extension of the industrial mobilization work of the Committee on Industrial Preparedness of the Naval Consulting Board and complete information as to our present manufacturing and producing facilities adaptable to many sided uses of modern warfare will be procured, analyzed and made use of.

One of the objects of the council will be to inform American manufacturers as to the part which they can and must play in national emergency. It is empowered to establish at once and maintain through subordinate bodies of specially qualified persons an auxiliary organization composed of men of the best creative and administrative capacity, capable of mobilizing to the utmost the resources of the country.

The personnel of the council's advisory members, appointed without regard to party, marks the entrance of the non-partisan engineer and professional man into American governmental affairs on a wider scale than ever before. It is responsive to the increased demand for and need of business

organization in public matters and for the presence there of the best specialists in their respective fields. In the present instance the time of some of the members of the Advisory Board could not be purchased. They serve the Government without remuneration, efficiency being their sole object and Americanism their only motive.

As indicated above the Council of National Defense therefore consists of six members of the Cabinet as follows:

The Secretary of War, Chairman.  
The Secretary of the Navy.  
The Secretary of the Interior.  
The Secretary of Agriculture.  
The Secretary of Commerce.  
The Secretary of Labor.

The Advisory Commission of the Council of National Defense consists of seven civilians appointed by the President. The members of the Advisory Commission are as follows:

Mr. Daniel Willard, President of the Baltimore and Ohio Railroad, Chairman.

Mr. Hollis Godfrey, LL.D., President of Drexel Institute, Philadelphia, Pa.

Mr. Howard E. Coffin, of Detroit (who is also chairman of the Committee on Industrial Preparedness of the Naval Consulting Board).

Dr. Franklin H. Martin, of Chicago.

Mr. Bernard Baruch, Financier, of New York.

Mr. Julius Rosenwald, Vice-President of Sears, Roebuck & Company, of Chicago.

Mr. Samuel Gompers, President of the Federation of Labor.

The two bodies meet in joint session at frequent intervals for the purpose of considering problems relating to national defense.

The executive activities of the Council of National Defense are coordinated and carried out through the medium of the Director of the Council of National Defense, Mr. W. S. Gifford, and the chiefs of the various departments represented by the members of the Advisory Commission. Dr. Frank F. Simpson is chief of the Medical Section of the Council of National Defense.

#### THE ADVISORY COMMISSION.

The organization of the Council and of the Advisory Commission provides that each member of the Advisory Commission shall gather about himself for the most effective co-ordination of the activities he represents, a committee or board consisting of representatives of governmental departments on the one hand, and civilian members on the other hand.

The Medical Committee, of which Dr. Franklin H. Martin is chairman, consists of:

Wm. C. Gorgas, Surgeon General of the U. S. Army.

Wm. C. Braisted, Surgeon General of the U. S. Navy.

Rupert Blue, Surgeon General of the U. S. Public Health Service.

Col. Jefferson R. Kean, Director General of Military Relief of the American Red Cross.

Dr. Wm. H. Welch, member of the National Council of Research.

Dr. Wm. J. Mayo, chairman of the Committee of American Physicians for Medical Preparedness.

Dr. Frank F. Simpson, Chief of the Medical Section of the Council of National Defense, and Secretary of the Committee of American Physicians for Medical Preparedness.

Many medical problems which have bearing upon the national defense are considered by Dr. Martin's Committee and by the Advisory Commission and the Council of National Defense before being put into action by the governmental departments concerned.

#### COMMITTEE OF AMERICAN PHYSICIANS FOR MEDICAL PREPAREDNESS—ITS COMPONENT PARTS.

##### *National and State Committees.*

In April, 1916, the national committee was appointed by the joint action of the presidents of the American Medical Association, the American Surgical Association, the Congress of American Physicians and Surgeons, the Clinical Congress of Surgeons of North America, and the American College of Surgeons. To that committee was delegated the responsible duty of formulating plans whereby the civilian medical resources of the United States might be ascertained and effectively co-ordinated for such purposes as might be required by the Federal Government.

The national committee organized, selected a chairman and secretary and an executive committee, and appointed a state committee of nine strong men in each state of the Union.

It is the fixed policy of this committee that all presidents and secretaries of the various state medical societies shall be members of their respective state committees during their incumbency in office. From the first it was contemplated that at the proper time the organization of committees would be perfected in each county of the country. That time has now come and county committees are being rapidly organized.

In each instance the state committees are expected to select the county committees and to supervise their formation.

#### NAME AND PERSONNEL OF COUNTY COMMITTEES.

It is the fixed policy of the Committee of American Physicians for Medical Preparedness that the various important medical interests and activities of each county shall be represented on the county committees. This is done for the purpose of co-ordinating the important interests and activities so that the medical profession of the nation may present a compact and effective organization for the purpose of aiding effectively in the national defense. In order that this plan may be carried out with uniformity and precision throughout the country, the various state committees have been requested to have all county committees bear the following distinguishing name, to wit: The Auxiliary Medical Defense Committee of..... County, in..... State. The state committees have also been requested to provide that the county committees shall include the following in their list of members:

1. All members of National Committee of the

Committee of American Physicians for Medical Preparedness, resident in the individual county.

2. Members of the State Committee resident in or near the individual county.

3. Representatives of the U. S. Army resident in the individual county.

4. Representatives of the U. S. Navy resident in the individual county.

5. Representatives of the U. S. Public Health Service resident in the individual county.

6. Representatives of the State Board of Medical Examiners residing in the individual county.

7. Representatives of the State or City Public Health Service.

8. Ranking medical officer of the National Guard.

9. President and Secretary of the local Medical Officers' Reserve Corps Association, if there should be such an organization.

10. Deans of medical schools.

11. President and Secretary of the County Medical Society.

12. President and Secretary of any other important medical societies.

13. Medical Director of the local Red Cross Units.

14. Other representative medical men.

#### DUTIES OF COUNTY COMMITTEES.

From time to time specific duties will be assigned to the various state and county committees. These duties will be in accord with the policy of the Council of National Defense, and should be executed promptly and precisely by those who are called upon to co-operate in this manner with the Council of National Defense.

The committees will call to their assistance those who have been appointed field aides by their various state committees and such other physicians as they may desire to have co-operate with them.

Among the specific duties which the county committees are requested to perform at this time are the following:

First: That these committees co-operate with the National and State Committees of the Committee of American Physicians for Medical Preparedness in their efforts to gain needful information regarding the civilian medical resources of their own communities, and in their efforts to co-ordinate civilian medical activities for prompt mobilization in case of need.

Second: That they secure applicants:

(a) For the Army Medical Corps. If the President should call the full complement of troops already authorized by Congress, the Regular Army would need about 1,200 additional medical officers. If a million men should be called, a corresponding increase would be required.

(b) For the Medical Officers' Reserve Corps. If war should come, 20,000 to 30,000 medical reserve officers should be enrolled.

(c) For the Naval Medical Corps which needs about 350 additional officers.

(d) For the Coast Defense Reserve Corps of the Navy. Several hundred high class reserve medical officers are desired.

(e) For the National Guard, such numbers as may be required to bring your local National Guard to full strength.

In the preparation for National Defense the first thing needed will be medical officers.

Physicians recommended for such service should be of the highest type. They should be free from suspicion of addiction to drugs or drink.

Medical officers who go to field duty should by preference be under the age of forty-five.

Third: That they co-operate, individually and collectively, with the Medical Department of the Army, Navy and Public Health Service and with the Council of National Defense.

Fourth: That they co-operate with the Red Cross in their efforts to bring that organization to the highest point of efficiency.

#### COMMITTEES OF AMERICAN PHYSICIANS—ACTIVITIES ACCOMPLISHED AND IN PROGRESS.

On the 26th of April, 1916, the Executive Committee of the Committee of American Physicians tendered the services of the committee to the President of the United States. He expressed himself as being pleased with the patriotic tender of services and regretted that existing laws did not permit the acceptance by the Federal Government of gratuitous services, but stated that the matter would be referred to the Secretary of War and the Secretary of the Navy for the purpose of devising plans by which the good offices of the medical profession could be accepted and utilized to best effect by the Federal Government. He further stated that the plans would be referred to the Committee of American Physicians for comments and suggestions. The Executive Committee was permitted to make suggestions regarding the bill creating the Council of National Defense.

During the last year this committee and its various subsidiary bodies have been actively engaged in formulating and carrying out various activities in conformity with the general plans for national defense, which have been undertaken by the Federal Government.

The splendid work done by the various state and other committees was of such extent and value that the Council of National Defense at its first meeting requested the Committee of American Physicians to continue their various activities under the guidance of the Council of National Defense, and asked the Secretary of the Committee of American Physicians to act as chief of the Medical Section of the Council of National Defense. Since that time the various activities have gone forward with renewed energy.

Some of the activities which have either been completed or are well under way, follow:

1st. Some 20,000 medical men selected from all parts of the country have been classified according to the training and the kinds of work which they do best.

2nd. An inventory of hospitals and other medical institutions is well under way.

3rd. It has been the fixed policy of the Committee of American Physicians to aid the American Red Cross in bringing its medical department to the highest point of efficiency. With that object

in view, and in order to foster the spirit of co-operation, the members of the National Committee of the Committee of American Physicians accepted invitations to become members of the national committee of the medical department of the American Red Cross. In order further to promote the harmonious co-operation of the two organizations, most of the members of the various state committees of the Committee of American Physicians were also made members of the state committees of the American Red Cross. The various county committees will also be expected to co-operate in carrying out the plans of the two organizations.

4th. The establishment of military training for senior medical students in a large percentage of the high grade medical schools of the country.

5th. The establishment of more effective military training for hospital groups for members of the Medical Officers' Reserve Corps, for dental students, and others.

6th. The appointment of a Committee for the Standardization of Medical and Surgical Supplies and Equipment. The purpose of this work is to designate a list of articles essential to the successful conduct of civilian and military medical and surgical activities so that in the event that it should become necessary to curtail production all of the energies of the drug and instrument makers would be devoted to necessary articles rather than to those which are desirable but not essential. On this Standardization Committee are representatives of the Army, the Navy, the Public Health Service, the Red Cross, the Council of National Defense, and a number of the most distinguished members of the various specialties of civilian medicine. In their work of co-ordination and standardization this committee will take council with the manufacturers of the various supplies under consideration.

7th. Much valuable information supplied by medical and other observers who have worked in the war zones of Europe is being gathered and classified.

8th. The presidents of important national medical organizations of the country have been requested to suggest to the medical section of the Council of National Defense the kinds of work which members of those organizations are best fitted to perform, and to suggest plans whereby their activities and resources might be utilized to best advantage. This request does not contemplate an inventory and organization of these resources. The purpose is that having received suggestions offered by the various organizations, those suggestions will be maturely considered and such as conform to the plans of the Council of National Defense and can be utilized to advantage, will be adopted. The various organizations will, in that case, be requested to co-operate fully and promptly in perfecting the plans of the Council of National Defense.

The foregoing memorandum embodies only a very small percentage of the problems now under consideration. It is neither wise nor desirable, however, to present them in detail at this time.

## Original Articles

### SOME EPIDEMIOLOGIC AND BACTERIOLOGIC OBSERVATIONS ON PARADYSENTERY INFECTIONS IN CALIFORNIA.\*

By K. F. MEYER and J. E. STICKEL, of the George Williams Hooper Foundation for Medical Research, University of California Medical School, San Francisco, California.

In this communication we desire to call attention to the existence of some forms of bacillary dysentery in California and to discuss briefly some of the most important epidemiologic and bacteriologic facts collected during the year 1916.

*Epidemiologic observations:* Before 1914 no information concerning the occurrence of bacillary dysentery could be found in the Reports of the California State Board of Health. A brief note<sup>1</sup> in October, 1914, indicates that three cases of dysentery were observed in this State and that the circumstances of their occurrence warranted further investigation. At that time the writer discussed with Dr. Sawyer, director of the State Hygienic Laboratory, the possibility of epidemic dysentery existing in various localities of California, but was told that so far no bacteriologic evidence had been presented to that effect.

Our interest in the nature of some cases of infantile diarrhoea was aroused in October and November, 1914, when through the courtesy of Dr. W. P. Lucas, of the Children's Department of the University of California Hospital, several stool specimens were submitted for bacteriologic studies. From several samples a bacillus closely related to the dysentery bacillus was isolated, which, according to some English, American and French writers, is responsible for infantile diarrhoea. This is the Morgan's bacillus I. Upon investigation it was found that these cases of gastro-enteritis all came from a small epidemic which had occurred in a private sanatorium in San Francisco. Twelve out of sixteen children showed clinical symptoms, and at least seven of these cases ended fatally. We do not wish to discuss at this time the mooted question as to whether the Morgan's bacillus is the causative agent in these cases of infectious diarrhoea. Ten Broeck,<sup>2</sup> based on his wide experience in Boston, believes that this bacillus has nothing to do with this type of disease of children. Ledingham,<sup>3</sup> Nègre<sup>4</sup> and others present evidence which leaves little doubt but that in a number of instances the group of Morgan's bacillus, or Metacoli (according to Bahr<sup>5</sup>), acquires pathogenic properties. Thus far we have failed to find the same organisms in normal children and adults, or in those suffering from gastro-enteritis.

Over fifty different samples of stools, obtained from the clinic of Dr. Lucas, were examined by one of us<sup>25</sup> and we isolated only once an organism which biochemically would correspond to the Morgan's bacillus, but we classified it with the metacoli bacilli on account of its serologic behavior.

\* Read before the San Francisco County Medical Society, February 13, 1917.

ior. It is our belief, therefore, that the small house-epidemic of infectious diarrhoea which occurred in a sanatorium in San Francisco, was caused by the Morgan's bacillus.

During continuous examinations of stool specimens throughout the year 1915, we could not find one dysentery organism, or a like bacterium, in a single instance, until March, 1916, when our attention was called to the extensive epidemic of dysentery in Napa, which was described in detail by Cummings<sup>6</sup> in the Bulletin of the State Board of Health. Through the courtesy of Drs. Cummings and Geiger, we were able to examine some specimens collected in Napa towards the end of the epidemic. From three of the five samples examined, a bacillus belonging to the so-called Paradyntery Group I, or Hiss-Y-Russell type, was isolated and identified by agglutination tests with the patient's serum. Cummings furnished evidence in this publication concerning the etiologic relationship of this organism to infectious diarrhoea among the population of Napa. Out of twenty sera at least ten gave reactions which, according to our present knowledge, could be considered as positive. These findings will be further considered in a later portion of this communication. The explosive character of the outbreak and various other circumstances point strongly to the water supply as the common source of infection.

This epidemic represents the first instance in which a Paradyntery bacillus was found to be the cause of dysentery contracted in California. Several cases of bacillary dysentery came to our notice, but they were always contracted in the Orient or in the Philippine or Hawaiian Islands. The same cannot be said with regard to amoebic dysentery; aside from numerous imported cases we have had the opportunity of examining specimens of patients who had never been out of the State of California and who doubtless contracted the infection from cyst carriers inside the boundary of the State. According to the recent studies of Sanford<sup>7</sup> on the geographic distribution of amoebiasis, it can be stated with considerable certainty that this type of intestinal infection is endemic in the United States and that it is not necessary to assume that they are the result of close contact with soldiers or other persons with tropical infections.

The observations and experience gathered from the dysentery outbreak at Napa suggested to us that possibly a number of cases of infantile diarrhoea in San Francisco were actually true cases of infantile dysentery which had escaped detection on account of some unknown technical errors, which will be discussed later. Through the continuous and liberal assistance of Drs. Lucas, Porter and Cummings, our efforts to collect evidence to that effect were successful and enabled us to find two small dysentery epidemics in San Francisco, one in Pinole, California, and the indications of the existence of some sporadic bacillary dysentery infections.

The most important data concerning the few epidemics observed and studied bacteriologically are briefly as follows:

#### 1. Family epidemic in San Francisco:

June 7, 1916, Dr. Porter informed the writer of two cases of infantile diarrhoea which were being treated at the Children's Hospital. Stool specimens were obtained and the bacteriologic results were as follows:

C. R., male, October 4, entered Children's Hospital with symptoms of diarrhoea:

(a) *Examination of stool:* Yellowish, creamy, pus-like feces with considerable amount of mucous, no blood. Microscopic examination showed numerous leucocytes, grampositive rods and spores, streptococci and diplococci, few gramnegative rods. The first bacteriologic examination showed a marked saccharolytic flora (62 per cent. gas in lactose broth) with predominance of the B. Welchii. As soon as the result in the second child was known, a second careful test for dysentery bacilli was made, and two colonies of B. paradynteriae, Group II (Flexner) were isolated. The serum of this patient (fourteen days later, or three weeks after the onset of the disease) agglutinated the isolated bacillus in a dilution of 1:800 in four hours. Clinically, the course of the infection was severe. A second and a third stool examination on June 17th and 20th were negative for dysentery bacilli.

(b) N. R., female; developed a mild attack of diarrhoea two days following the first signs of gastro enteritis of the brother "C. R."

*Examination of stool:* The specimen obtained by rectal tubing consisted of a small flake of mucous tinged with blood. On litmuslactose plates about ten typical colonies of B. paradynteriae Group II (Flexner) developed in twenty-four hours. Patient's serum, on June 17th, agglutinated several paradyntery bacilli in a dilution of 1:320 to 1:640. Stool examinations of June 17th and 20th were negative for dysentery bacilli.

(c) F. R., male; this patient was brought to the Outpatient Department of the University of California Hospital on account of acute diarrhoea.

*Examination of stool:* On June 14th and 19th stool specimens were obtained from the younger brother of the two patients mentioned above. On both occasions identical paradyntery bacilli were isolated.

(d) Mrs. R., the mother of these children, complained of frequent stools and abdominal pains. A stool examination on June 15th revealed also paradyntery bacilli which corresponded biochemically and serologically with those obtained from her children.

It was impossible to determine in what manner the infection was introduced into this family. C. R. probably was responsible for the subsequent contact infections of F. R. and Mrs. R. Unfortunately, no specimens could be obtained from the father, a furniture mover, and the two older children. Neither of them showed clinical symptoms, according to the mother's statement.

Another contact infection of similar character, involving the two children of one family, was found through the service of the children's department of the University of California Hospital.

## 2. Family epidemic in San Francisco:

In August, 1916, Dr. Newell examined, under the writer's supervision, the stools of two children and isolated bacilli which we later identified as *B. paratyphosus* Group II (Flexner).

(a) J. L.; male, two and one-half years old, entered the Hospital on July 31st; had diarrhoea with pus, mucous and blood in the discharges. Temperature 39.9°. Blood culture was negative. On August 2nd *paratyphosus* bacilli were isolated, equal numbers of *B. coli* and *B. paratyphosus* were found on the dilution plates. Course severe, and complicated with secondary pneumonia and intoxication. The serum of this patient agglutinated the isolated *paratyphosus* bacillus in a dilution of 1:640 and a stock culture of the Group II (Flexner) in a dilution of 1:80 to 1:160. A typical strain of Group I (Y-Group) was not agglutinated higher than 1:10.

(b) G. L., male, one and one-half years old, developed symptoms of diarrhoea and vomiting twenty-four hours later than K. L., his brother. On entrance into the hospital the discharges were greenish, mixed with mucous, and, according to the parents' statement, blood-containing.

The temperature, which was 39.8° on the patient's entrance, resumed a normal level the following day. Blood cultures were negative.

Stool examinations on August 2nd and 5th showed *paratyphosus* bacilli mixed with equal numbers of staphylococci and coli organisms. The course of the disease was very mild.

The only agglutination test made on August 15th with the patient's serum gave a positive result with various *paratyphosus* strains, but not with the typhoid and dysentery bacillus Shiga. In these two cases also the nature of a small family epidemic due to the *B. paratyphosus* Group II (Flexner) is proven by the bacteriologic findings. Unfortunately we could not determine the source of infection, and it is uncertain whether the older boy, K. L., transmitted the organism to his brother, or whether both children contracted the infection simultaneously from the same source. It is to be regretted that no bacteriologic examinations of the intestinal contents of the parents and of other relatives were possible.

## 3. Epidemic in Pinole, California:

On September 27, 1916, Dr. J. G. Cummings, of the Bureau of Communicable Diseases, brought to our laboratory specimens of stools obtained from two adults suffering from acute gastro-enteritis. The two patients belonged to a small epidemic of eighteen cases of dysentery which occurred in Pinole. An incomplete investigation revealed that probably the drinking supply was temporarily contaminated by street-surface water which ran into the spring water.

The bacteriologic examinations of one specimen of stool (S) showed the presence of *B. paratyphosus* Group II (Flexner).

Naturally, it is impossible to state with certainty that the epidemic of diarrhoea which occurred in Pinole was actually caused by *paratyphosus* bacilli. In the light of the observations at Napa, San Francisco, and numerous other localities also, in the

southern part of the State, it is not unlikely that the Flexner type of *paratyphosus* bacillus was the causative factor in this outbreak. In this connection it is well to call attention to the urgent need of careful bacteriologic examinations in such outbreaks, because our knowledge concerning *paratyphosus* infections and the manner in which these epidemics spread, is still based on very meager data.

Dr. Sawyer called my attention also to an outbreak of dysentery in the prisons of this State, but thus far we have not received material for examination. To date the most constant findings of *paratyphosus* bacilli in this State have been made during epidemics, but it is erroneous to suppose that such a condition is the rule. A few observations suggest that also in sporadic cases of infantile diarrhoea these organisms can be etiologic agents, and some incomplete observations also indicate that in adults acute or chronic dysentery infections in California are due to *paratyphosus* strains. The following observations support this contention:

## 4. Sporadic or endemic cases of *paratyphosus* infections:

(a) Stool specimens from child "C", treated at the Children's Hospital in October, 1916; two bacteriologic examinations demonstrated the presence of *B. paratyphosus* Group III. No serum tests were possible.

(b) Stool specimens of child "H. H.," treated at the Children's Hospital in October, 1916; one bacteriologic examination showed non lactose fermenting dysentery bacilli which resembled those of Group III. A detailed study suggests, however, that the isolated bacteria belong in the separate group of the *paratyphosus* organisms.

(c) Dr. Geiger, of the Bureau of Communicable Diseases, told the writer that he isolated a *paratyphosus* bacillus of Group I (Y-type) from the stool specimens of an elderly woman suffering from chronic diarrhoea and being treated in Oakland.

From the above cited observations, which by no means represent the results of a systematic inquiry, but rather the outcome of casual observations, we obtained the impression that bacillary dysentery is a fairly constant and frequent infection in California. At present it is, naturally, impossible to state in figures the possible frequency of the disease. The clinical diagnosis: "dysentery," is so rarely made that the morbidity and mortality statistics give an inaccurate account of the existing conditions. With the exception of the epidemic in Napa, and possibly that in Pinole, the transmission of the infection took place in the form of a direct infection, from person to person. In the light of these facts it appears proper to assume that in the surroundings of these contact cases chronic "carriers" existed, which disseminated dysentery bacilli. Through recent studies of Rumpel<sup>8</sup>, Fränkel<sup>9</sup>, Gettings<sup>10</sup>, Verzare and Weszeczky<sup>11</sup> and many others, such carriers are not uncommon in *paratyphosus* because the infection has a great tendency to run a mild, chronic course and is thus conducive to the "carrier state."

The supposition that some cases of chronic

colitis are in reality chronic dysentery infections, is justified by some recent observations of Sonne<sup>12</sup> in Denmark who could trace several family infections to relatives suffering from chronic intestinal disorders. Repeated stool examinations as a rule give negative results, and only during exacerbations—after the patient has had one or several severe attacks of diarrhoea—can dysentery bacilli be isolated. In most of the cases these chronic carriers are probably a source of infection only during or after these attacks. An examination of their intestinal flora will frequently be made at a time when no organisms are eliminated or by methods which fail to demonstrate dysentery organisms, thus these patients escape detection. Such carriers are, in all probability, responsible also for the water-born epidemics thus far observed in this State.

Valuable information as to the extent and frequency of such dysentery infections could be collected if bacteriologic stool examinations of sporadic cases of diarrhoea would be conducted more often than is at present the case. It is not unlikely that a large number of gastro-enteritides of acute or chronic natures are in reality true dysentery infections. Evidence to that effect has been collected by various English, German and Danish writers. These have been particularly emphasized by Sonne<sup>12</sup>, who describes conditions similar to those in California. In this connection it is not intended to imply that all the cases of diarrhoea are due to paradysentery bacillus; this is particularly true for infantile or summer diarrhoeas in children. The studies of one of us during the year 1915 have shown that the stools of children suffering from gastro enteritis or cholera infantum contained no dysentery organisms. This failure may be in part due to the technique of examinations, or to the particular selection of cases. These negative findings are quite in contrast with the frequent demonstration of paradysentery bacilli in the few cases examined during 1916. From these studies we gained the impression that the conclusions of Ten Broeck<sup>2</sup> are correct. This worker, in his study of infantile diarrhoea in Boston during 1914, found that probably the majority of such cases develop on a *B. dysenteriae* basis. The causes of infantile diarrhoea in California are, therefore, similar—if not identical—to those in the Eastern States. Many cases of infantile diarrhoea are, in reality, true cases of infantile dysentery, and the term "Bacillary dysentery" should be frankly applied. So far only paradysentery, and no Shiga bacilli, have been found. The clinical course apparently indicates but rarely the nature of the infection; our observations correspond with those of Holt<sup>13</sup>, namely, that either fatal cases or those with signs of severe intoxication are due to other organisms (Morgan's bacilli or streptococci) or our methods fail to demonstrate the presence of dysentery bacilli. The case of "C. R.," in the first family epidemic, is chosen to illustrate this point. The bacteriologic examinations of the stool of "C. R." pointed to a gas bacillus or *B. Welchii* diarrhoea; yet, paradysentery findings in the sister of this patient suggested a renewed study of the intestinal flora and proved the gas bacillus infection to be

secondary to a true paradysentery infection. This latter diagnosis is also supported by the positive serologic findings. Clinically, the uncomplicated dysentery infection was mild; the superimposed gas bacillus infection, on the other hand, was, in our opinion, responsible for the severe course of the infection.

In some recent publications Ten Broeck<sup>2</sup> expressed the opinion that in all probability the *B. Welchii* is only a secondary invader in infantile diarrhoea. A perusal of the extensive literature on this subject, so ably presented by Simonds<sup>14</sup> in his monograph on *B. Welchii*, also gives the impression that this organism is only indirectly, casually related to diarrhoea.

How far streptococci are connected with infantile diarrhoea in this relation, it is difficult to say. We studied an infection in a child who apparently contracted the causative streptococcus from his grandmother suffering from chronic diarrhoea. Only one examination was made; it is therefore possible that the main causative organism was not isolated. *B. enteritidis* infections may also at times show the clinical manifestations of dysentery, as one of us<sup>15</sup> was able to demonstrate.

#### *Bacteriologic observations.*

##### (a) Stool examinations:

Aside from these very suggestive observations which prompted the few remarks on the etiology of infantile diarrhoea in California, the bacteriologic findings are also interesting. Representatives of three different groups of paradysentery bacilli have been isolated. In the Napa epidemic, Group I, and in the two house epidemics and the case from Pinole, Group II, and in one sporadic case, Group III, a consideration of these facts is presented in the next paragraph.

It is in the interest of the clinician and health officer that a rapid diagnosis of cases of diarrhoea be made. In the diagnosis of dysentery the bacteriologist unfortunately has many difficulties to overcome. Cultivation of the organisms is more difficult than in the case of typhoid and cholera in which we can isolate the specific organisms from the blood or by proper enrichment media from the intestinal contents. In the case of cholera, other organisms than the vibrio receive a set-back in the intestines, so that together with the peptone enriching fluid nearly one hundred per cent. of infections can be detected.

In dysentery infections, as a rule, the organisms are excreted intermittently, and two or several examinations of the feces are necessary. Our culture media, when not properly prepared, inhibit the growth of these organisms. Proper reactions of the media are absolutely essential. Conditions and substances which suppress the growth of *B. coli* generally hinder also the outgrowth of *B. dysenteriae* (malachite green, brilliant green, etc.). At the present time we are investigating the best composition of the culture media, in an attempt to find a substratum in which an enrichment of the organisms can be obtained. Very promising results have been obtained with agar media containing definite amounts of peptic or tryptic digests. As indicators of growth we used in several series lit-

No. of Cases	Source of Specimens	Minimal Date of the Patient	Number of Colonies Counted	Biochemical Reactions										Serologic Reactions			Classification
				Dextrin Solubility	Lactose	Sucrose	Saccharose	Mannite	Glycerol	Dextrin	Thymose	Litmus Whay	Indol Production	Immune Serum prepared with cells of Group I (1:1000)	Immune Serum prepared with strain of Group II (1:1000)	Immune Serum prepared with strain of Group III (1:1000)	
1	Epidemic at Santa Fe, N.M.	Normal Strains of Typhoid	4 (Numerous)	Acid	Normal	Normal	Normal or later slightly acid	Acid	Acid, later normal	Normal	Normal	Acid and then normal	+	5000	100-500	-	Group 2 (Y)
2	Child, acute diarrhoea	Child, acute diarrhoea	5 (Numerous)	Acid	Normal	Normal	Normal	Acid	Acid	Normal	Normal	Acid and then normal	+	5000	100-500	0	Group 1 (Y)
3	Infantile diarrhoea	Infantile diarrhoea	5 (Few)	Acid	Normal	Acid	Normal	Acid	Acid	Normal	Normal	Acid and then normal	-	500-1000	1500-2000	0	Group II (Flexner)
4	Family outbreak in San Francisco, June 1916	Infantile diarrhoea	4 (Few)	Acid	Normal	Acid	Normal	Acid	Acid	Normal	Normal	Acid-Normal	0	-500	1000	-	Group II (Flexner)
5	Infantile diarrhoea	Infantile diarrhoea	4 (Few)	Acid	Normal	Acid	Normal	Acid	Acid	Normal	Normal	Acid-Normal	0	100-500	2000	-	Group II (Flexner)
6	Acute acid diarrhoea	Acute acid diarrhoea	5 (Few)	Acid	Normal	Normal	Normal	Acid	Acid	Normal	Normal	Acid-Normal	0	500	1000	-	Group II (Flexner)
7	Family outbreak in San Francisco, June 1916	Infantile diarrhoea	5 (Numerous)	Acid	Normal	Acid	Normal	Acid	Acid	Normal	Normal	Acid, then normal	0	500	500-1000	0	Group II (Flexner)
8	Infantile diarrhoea	Infantile diarrhoea	5 (Numerous)	Acid	Normal	Acid	Normal	Acid	Acid	Normal	Normal	Acid, then normal	0	200-500	500-1000	0	Group II (Flexner)
9	Epidemic at Santa Fe, N.M.	Acute diarrhoea	5 (Few)	Acid	Normal	Acid	Normal	Acid	Acid	Normal	Normal	Acid, then normal	0	1000	5000	0	Group II (Flexner)
10	Infantile diarrhoea	Infantile diarrhoea	5 (Numerous)	Acid	Normal	Acid	Normal	Acid	Acid	Normal	Normal	Acid, then normal	0	0	0	0	Group III (new)
11	Infantile diarrhoea	Infantile diarrhoea	1 (Numerous)	Acid	Normal	Acid	Normal	Acid	Acid	Normal	Normal	Acid, then normal	0	500-5000	1000-5000	0	Group II (Flexner)

Routine examination of stool specimens for dysentery bacilli.

Stool specimen

(best mucous flake)

Surface plating on litmus lactose or Congored agar (yeast or amino-acid agar).  
blue or clear colonies, respectively, of gram-negative rods transplanted on agar slants or broth or peptone-solution.

Motile	Water of condensation.	Non-motile
Typhoid-paratyphoid group or Morgan's bacillus I.		
Not fermented	3% mannite peptone solution fermented	
Dysentery Shiga group	Para-dysentery group	
Subgroup I. (Y-type)	Subgroup II. (Flexner type)	Subgroup III. (New group)
Glucose: acid only;	Glucose: acid only;	Glucose: acid only;
Lactose: not fermented	Lactose: not fermented;	Lactose: not fermented;
Maltose: (2.5%): irregular, ordinarily not fermented;	Maltose (2.5%) negative and then acid;	Maltose (2.5%): acid;
Saccharose: not fermented, often late acid;	Saccharose: negative;	Saccharose: acid late;
Rhamnose: not fermented or slight acid;	Rhamnose: negative or slight acid;	Rhamnose: acid;
Indol: traces (±)	Indol: traces (±)	Indol: (0)
Litmus whay: acid, then normal;	Litmus-whay: acid and then normal;	Litmus-whay: acid, then normal;
Agglutination of this organism by:	Agglutination of this organism by:	Agglutination of this organism by:
Serum of Subgroup I (titer 1:10,000): 1:5000-10,000;	Serum of Subgroup I: 1:2500	Serum of Subgroup I: 0-1:50;
Serum of Subgroup II ( " 1:5000 ) : 1:1000-5000;	" of Subgroup II: 1:5000	Serum of Subgroup II: 0-1:50;
Serum of Subgroup III ( " 1:500 ) : 1:10 - ,100;	" of Subgroup III: 1:50	Serum of Subgroup III: 1:500.

mus lactose solutions and recently also Congo red-lactose powder which is added to the liquified agar, producing a medium of remarkable differentiating properties. Endo-medium is unreliable, according to our experience, because several lots of agar exhibited marked inhibitive properties for the dysentery bacilli.

The isolated dysentery organisms which are recognized by their immobility are further diagnosed by fermentative reactions. For the true dysentery bacilli these reactions are usually stable and, together with the agglutination test, absolutely reliable. On the other hand, the fermentation reactions of the atoxic or paradysentery strains are not absolutely stable and may lead to fallacious conclusions. Through the studies of Hiss, Lentz and others, the fermentation of maltose and saccharose were considered of diagnostic value. Recent reports from the extensive epidemics in the War Zone show, however, the results to be so varied that no diagnosis and classification should be attempted on the basis of fermentation of the carbohydrates alone. Some information as to the position of the paradysentery bacilli in the varied groups can be obtained by using Rhamnose-broth and litmus whey. At least two groups can be recognized, according to Sonne<sup>10</sup>. As Hehewerth<sup>17</sup> points out, a good deal of confusion has hitherto been introduced into this subject by workers who rely on sugar reactions alone for the differentiation of the various species or who neglect these and base a classification solely on agglutination reactions. By the use of specific sera of the various groups, a classification is possible, in our experience, if one keeps in mind that co-agglutination and marked group agglutination are common occurrences among paradysentery organisms. For example, a serum produced with an organism of Group I (Y-type) coagglutinates the bacteria of Group II in fairly high dilutions, and again, a Group II (Flexner) serum clumps the organisms of Group I in dilutions which offer difficulties for interpretation.

The origin of the sera is here of importance. As a rule horse sera contain large amounts of normal agglutinins for the bacteria of Group II (Flexner). By absorption of this component, the difficulty may be overcome, but the process is very laborious for ordinary clinical use. Rabbit sera produced by only two or three injections of living organisms are more specific and, according to our studies, are really of great help.

Another obstacle in connection with the agglutination of the isolated bacteria is the phenomenon of para-agglutination which has received proper attention through the studies of Kuhn, Woihte and Gildemeister,<sup>18</sup> but has not as yet been considered in its full value in this country. By para-agglutination is meant that organisms closely related to the *B. coli*, and even streptococci obtained from the feces of dysentery patients, are agglutinated by a dysentery serum. Occasionally also, fecal organisms isolated from typhoid patients have been known to exhibit para-agglutinated properties. The susceptibility is lost after repeated subculturing. Such races of bacteria can be created by growing the same on media containing extracts of dysen-

tery organisms. It is evident, in view of these facts, that certain errors may arise. It would not be of much practical moment, in an acute case, if a non-pathogenic bacillus were mistaken for the true cause of the disease, but it would be a grave error to stigmatize a person as a carrier who happened to be passing harmless para-agglutinable bacilli. Another pitfall is that para-agglutinable bacilli may be looked upon as the cause of any given bowel affection, whereas the true offender is one of the well-known pathogenic bacteria which has escaped detection. Mistakes of this kind have doubtless occurred in the past and may account for the large and ever-increasing number of different bacilli of the dysentery group which were supposed to cause the disease. Since para-agglutinable bacteria retain their power to ferment certain sugars intact, the necessity for supplementing the agglutination test with fermentation tests is quite evident.

The result of the bacteriologic examination depends on the laboratory worker and the uniform scheme which he is accustomed to follow. From a scientific viewpoint, particularly in connection with the problem of the pathogenesis of gall-bladder carriers, systemic blood cultures should also be made in paradysentery cases, because Ghon,<sup>19</sup> Frankel,<sup>20</sup> and Ten Broeck<sup>21</sup> and others have shown that in a few cases the dysentery organisms circulate in the blood.

In Table II we have given the method of isolation and identification of dysentery or paradysentery bacilli which, in our laboratory, has proven dependable and fully satisfactory even for very difficult cases (rabbit-carrier experiments).

By using the above technic we have thus far isolated three types of paradysentery bacilli, namely, the representatives of Group I, or Hiss-Y-Russel group in one epidemic; Group II, or Flexner group, in three epidemics; and two sporadic cases; and Group III in one sporadic case. The representatives of Group I and Group II are well known in this country; Group III, however, has only been recognized as important in paradysentery infections through the careful studies of Sonne,<sup>10</sup> Barthlein, and others. The characteristic, early rhamnose fermentation and the absence of co-agglutination with paradysentery sera of Groups I and II are of diagnostic value and identification. Until further specimens have been examined we cannot state the frequency nor the importance of these strains in the epidemiology of paradysentery. In the light of Sonne's statistical data, the representatives of Group III are more numerous in mild dysentery cases than those of Flexner and Hiss Groups.

#### (b) Agglutination Tests:

Testing the patient's serum with a known dysentery bacillus is an useful aid to diagnosis, but in this connection certain facts must be kept in mind. The numerous studies of Lentz, Sonne,<sup>22</sup> Ritchie,<sup>23</sup> and Frankel<sup>20</sup> have shown that the serum of a patient, infected or convalescent, agglutinates the *B. dysenteriae* Shiga-Kruse in a dilution higher than 1:50, but sometimes the same serum coagglutinates the dysentery bacillus of Groups I and

II. On the other hand, the serum of patients with paradyseutery never agglutinates the dysentery bacillus Shiga, a fact which was well apparent in our few observations; such sera agglutinate, however, the Y- and Flexner-types in the same dilutions, so that a differentiation in types is impossible. Only Castellani's absorption method will help, if properly carried out.

Far more important is the question, namely, in what dilution the serum agglutination is sufficient for a diagnosis of a paradyseutery infection. As a result of extensive studies by many workers in recent years, the following dilutions can be considered as diagnostic. B. dysenteriae Shiga: complete agglutination in 1:64 dilution, and higher. B. paradyseuteryae: agglutination in a dilution above 1:100 (1:128) is significant. Titers of the sera of females are uniformly higher than in males. Some investigators even state that the agglutination should be higher than 1:160.

In order to make the agglutination test absolutely reliable, it is necessary to test the patient's blood also against typhoid and paratyphoid. Only when the agglutination of the dysentery bacillus is markedly greater than that of the others, are we justified in making the diagnosis of para-dysentery. If this precaution is not taken, group agglutination of the dysentery bacillus—caused by a previous attack of typhoid fever or anti-typhoid inoculation—may not be detected, and lead to erroneous conclusions (Jacobitz).<sup>24</sup>

The above stated upper limits of agglutination of normal sera are naturally arbitrary and should be determined by each investigator for his own strains.

Sonne<sup>22</sup> points out that the agglutination test for paradyseutery infections, due to organisms of Groups I and II, is not of much value unless a very high titer is obtained. He found that in typical cases the reactions ran as follows:

1	1:1000
1	1:250
2	1:100
1	1:50

On the other hand, the serum tests of patients infected with organisms of Group III gave positive reactions in eleven out of twelve specimens examined; (dilutions 1:10 to 1:250); 245 sera of individuals, not infected, never gave an agglutination in a dilution of 1:10.

Unfortunately, we were unable to verify some of these points discussed above, because the patients either escaped from our observations or refused to submit to the tests. From the few agglutination tests which we made in connection with the epidemiologic studies, we believe, however, that they are of value and should by all means be used in a search for carriers.

#### CONCLUSIONS.

(1) Paradyseutery, caused by paradyseutery bacilli of the Hiss-Y-Russel type (Group I), the Flexner type (Group II), and the new, well defined type (Group III, Sonne), exists in epidemic or endemic form in California.

(2) Infantile diarrhoea is, in some cases, due

to paradyseutery bacilli and should be frankly designated as "infantile dysentery."

(3) Bacteriologic stool and blood examinations, according to a definite working scheme, should be supplemented by agglutination tests of the patient's serum.

(4) To further our knowledge concerning the epidemiology of paradyseutery in California, systematic stool examinations of acute and chronic cases of colitis should be made.\*

#### Discussion.

Dr. B. Jablons: I am extremely indebted to Dr. Meyer because he has furnished the link in the diagnosis of several cases I have observed in the last two years.

He mentioned that there were cases of chronic colitis which were carriers and responsible for these epidemics. We had two such individuals from which we isolated what were supposed to be Flexner bacilli. One case was diagnosed as mucous colitis and had gone the rounds of physicians for several years. She had had intermittent attacks of diarrhea, with pain and general constitutional symptoms. On culturing her feces on one occasion, we isolated an organism which failed to ferment lactose.

I had no agglutinating serum at that time, but I have since been able to secure some through Dr. Meyer's courtesy. As far as I know, Dr. Meyer has succeeded in establishing at the Hooper Research, the only depot where one can obtain agglutinating sera for the varied microorganisms. We prepared a vaccine for this patient and she improved remarkably under vaccine treatment. When it was discontinued she would have a relapse, with diarrhoea, which at that time I considered an anaphylactic response to the bacteria she was still harboring, and finally, after a long period of immunization, she got well.

Incidentally I had occasion to discover two other such cases that had been diagnosed as chronic enteritis or colitis. In two other cases I studied we found the *Bacillus fecalis alkaligenes*. More recently I have read an article published by some French observers, who claim to have isolated this organism from the blood proving its pathogenic relationship.

We have used litmus lactose agar for a number of years, not because we felt that the inhibiting influence of the anilin dyes prevented growth of material, but simply because of the cheapness of litmus. I think we should be very grateful to Dr. Meyer and Miss Stickel for elaborating this media, and I intend to use it in the future, for I think it may point the way to the isolation of many other organisms.

With regard to the agglutination of Flexner bacilli, I had occasion to study an epidemic in Servia during the first Balkan war, and there we found, in attempting to carry out the Widal test, that it would be agglutinated by most sera in a dilution of 1:200.

I considered that this was possibly due to an earlier infection by the Flexner organism. We also used horse serum, and had the same experience as Dr. Meyer.

Dr. Herbert Gunn: The difficulty in carrying out the examinations of the stool, which Dr. Meyer points out, is what has deterred most workers here from attempting it. It requires a trained bacteriologist, one who is absolutely familiar with all the details of the work, to carry it out successfully. The unfortunate part, from a practical standpoint, is that most bacillary dysenteries are

\* The George Williams Hooper Foundation is very much interested in this disease and co-operation will be highly appreciated. Specimens should be sent to the following address: Dr. K. F. Meyer, The George Williams Hooper Foundation for Medical Research, Second and Parnassus avenues, San Francisco, California.

very acute; they may be severe, but are usually quite acute in their course. Most of these cases would be practically well, or dead, before the stool examination would point to the cause of the disease. In chronic cases or in an epidemic the isolation of the bacillus would prove of great value.

It is a well known fact that the agglutination, or Widal test, is rarely demonstrable until after a number of days have elapsed. In many British war zone districts, where bacillary and amebic dysenteries are present, they give immediately emetin, in the hope that the acute symptoms will abate in the amebic cases. That test is valueless in the chronic cases because emetin has so little immediate effect on the vegetative form of ameba, and almost none on the encysted form.

I had one patient to whom I gave one gr. of emetin a day for seventeen days, and on the seventeenth day the stool contained vegetative form. One dose of salvarsan at that time apparently affected his cure.

There is no question that cases of amebic dysentery originate in California; for years I have seen cases which have developed here. I have one patient at present with amebiasis who has never been out of the state and another who in all probability contracted the disease here. The amebic form of dysentery will be found much more frequently if sought for. Many of these cases of colitis can be demonstrated to be amebic if the stools are properly examined; some cases of so-called mucous colitis may also be cleared up.

Certainly, in all suspicious cases where amebae are not present, the stools should be examined for bacillary dysentery, and we will probably avail ourselves in future of Dr. Meyer's offer to help us out.

Dr. Meyer (closing discussions): In emetin-resistance of *Endamoeba histolytica* the use of salvarsan is to be highly recommended. In our experience in the tropics the improper use of emetin frequently produces drug resistant strains, and in numerous instances of this character salvarsan has proven exceedingly effective.

We had at the University Hospital a case of dysentery with remarkable emetin resistance of the amoeba. Two doses cured the clinical symptoms, but failed to destroy the cysts. So far, oil of chenopodium—thus far used against hookworm infections—is the only medicament known which promises relief to amoebic cyst-carriers. The investigations in the war zone will furnish us with information concerning the value of this and other drugs for the cure of these potential carriers.

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## THE SANITARY SERVICE OF WAR AND THE DEMOBILIZATION PERIOD.\*

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At a previous period consideration was given to the examination of the individual soldier in times of peace. How much of this system will be held to in time of war will depend greatly upon the character of the war we may be engaged in; also upon the kind of military system that may be in force at that time.

If the conflict should be one of limited object or extent, such as the pacification of Mexico, armies of only moderate size will be required. If men are drawn by lot as contemplated in some of the plans for universal military service recruiting officers will be able to pick and choose as they please. Substandard men will not need to be considered at all. If the quota from a certain district is found to be unfit it will be necessary merely to requisition others to fill their places.

If, however, even in a limited conflict our present volunteer system is retained it may be necessary to let down the bars to a considerable extent. This will be deplorable both from the standpoint of its bearing upon the efficiency of our armies in the field and on account of the great increase in cost to the government in caring for an unnecessarily large number of disabled soldiers during and after campaigns; and in disability pensions.

In the event of our being engaged in a conflict of unlimited extent such as is going on now in Europe we will be required to draw into our armies the last ounce of possibly useful human material. Many having physical defects that would bar their enlistment in times of peace will have to be taken and duties commensurate with their physical abilities found for them somewhere in the great military machine.

Places will be found for those possessing such defects as incipient tuberculosis, heart disease of mild degree and hernias, in some of the multifarious duties connected with the supply or keeping of accounts and records of great armies in the field.

As to the effect of war conditions upon the course and incidence of tuberculosis reports are confusing. One report says that among soldiers at the front most of the tubercular cases are benefited by the outdoor life led by the men. Another that under the fearful hardships of trench life many new cases develop and incipient cases become active and even florid.

There is a great deal of tuberculosis in the armies in Europe according to reports from British and French authorities and much study is being devoted to the problem. It is evident that

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much of it as it exists in the British army in France may be explained by lax methods of examination. Until conscription was enforced men were so badly needed that the medical examination was not very searching. Consequently many doubtful cases were let through.

The situation confronting the British authorities at this time was, presumably, identical with the one we will be forced to meet in our next great war. And we can profit very largely by their experience.

With regard to the relationship of tuberculosis to war Osler has recently made the following observations:

1. In the majority of cases the germ enlists with the soldier. A few, a very few, catch the disease in infected billets or barracks. What percentage of men is infected is unknown but it is rare not to find traces of tuberculosis in men of enlistment age who have died from other causes.

2. Of one million enlisted men of aforesaid age the proportion to acquire tuberculosis is much smaller than if these men had remained in civil life. It will be possible later to work out the exact incidence for comparison, with figures already available; but it seems established that the circumstances of a soldier's life do not, as a rule, weaken but strengthen resistance.

3. Exposure to hardships in the field, injury, drink, syphilis, may bring about favoring conditions for bacilli that already exist or which may gain access to the patient and the soldier reports sick with tuberculosis of lungs, glands, pleura, bones or brain.

From a summing up of evidence as presented by these two diverse viewpoints it would seem to be a safe inference that to enlist doubtful cases on the supposition that they will eventually become hardened involves too great a risk.

Heart disease as affected by field conditions is another problem that has received a great deal of attention from the British authorities. They have attempted to conserve for military uses a good part of those individuals with compensating heart lesions who would be cast into the discard at a time when the need for men was less urgent. After the routine examination all cases with cardiac defects are placed in a group to be further examined by specialists. The finer methods of cardiac diagnosis are brought into use, the electrocardiograph, particularly, having been found of value in making the final decision. By the aid of such exact methods it has been found possible to divide the candidates into five classes. (1) General service at home and abroad. (2) Field service at home. (3) Garrison service. (4) Labor service or sedentary work. (5) Unfit for any army service.

In a previous paper your attention was invited to the observation of certain phases of mental instability as related to the examination of applicants for enlistment. It may be of interest to you to consider for a moment some of the effects of war conditions upon the mind and nervous system of combatants.

The influences that are brought to bear upon the minds and nerves of soldiers during campaigns are of divers character. They are by no means all of a depressing or damaging nature. There is a certain mental buoyancy and nerve energy noticeable in an army in the field, which is pitched far above the average tone of most of the individual soldiers going to make it up. Proof of this is seen in the expressions of ready humor and bursts of rollicking song so constantly to be observed among troops in the field when there is action, actual or imminent.

The constant tension, excitement and traumatic effect of nearby high explosives tend to nerve exhaustion and injury so that the neuro-psychoses are common. This may occur in individuals without hereditary taint, in which case recovery is prompt. Those with a psychopathic taint often show no will to recover and often intensify their symptoms through a conscious or subconscious wish to be sent away from the battle zone.

While considering the mental and physical vagaries of the human material with which our war-time activities will be concerned a brief allusion to the subject of malingering may be of interest to you.

Many army surgeons of experience and with a conscientious desire to see that the government is not imposed upon, acquire a certain reputation among the enlisted men of the command. They are said to treat every man who reports at sick call as a "beat" until proven otherwise. This attitude goes far to discourage men from reporting for medical treatment unless actually in need of it and certainly has its advantages. Sick call must not be allowed to become a popular institution. Soldiers must be encouraged to carry their minor physical troubles lightly; to disregard them as much as possible. On the other hand, harsh methods here may dissuade actually sick men from reporting for treatment; individuals may suffer and, conceivably, epidemics gain headway before recognition. Here, as elsewhere, good judgment and accumulated experience point to a middle course.

It is a mistake to assume that because a soldier is detected in an obvious overstatement of his case that he is a malingerer. Allowance must be made for his limitations in powers of expression and his natural desire to secure a hearing for his case with sympathy and treatment.

When all these allowances have been made, however, there are still many who attempt to evade military duty by malingering. To many soldiers in active service, harassed almost beyond endurance, a short stay in hospital offers a moment's respite from requirements almost beyond their power. There are many other motives for malingering but in every case there is the desire, conscious or subconscious, to gain some particular end through pretense of disease or injury.

The soldier, then, matches his wits against those of the medical officer. With some of them doubts will be raised in our minds to a sufficient extent to make us feel justified in excusing him from

some of his duties or even taking him in hospital for a short period of observation. The latter expedient should be adopted only as a last resort, for once in the hospital it is often difficult to dislodge him. The experienced eye can often recognize the malingerer at first appearance, by his surly mien, his caution in answering questions, his lack of definiteness and constant appearance of being on guard.

In its application to special cases the subject of malingering is far too broad to consider in the short time at our disposal. It was desired merely to call to your attention, by a few generalizations, its importance to the medical officer.

The effect of war conditions on the venereal rate is interesting to note. When enemy territory is occupied there is a marked derangement, often a paralysis of industrial conditions. Thousands of women who formerly earned a living by honest toil are no longer able to do so. Thousands of others who formerly lived comfortably, supported by male relatives, are deprived of this support and have no way of supporting themselves. As a result the volitional class of prostitutes is heavily augmented from among those who can find no other way of keeping alive.

Consequently we may expect and do find a great increase in venereal disease under these conditions. Statistics gathered from the European war zones show that these diseases have increased 50% since the war began and that the increase applies equally to the civilian and the military population. The number of ineffectives resulting among the troops is very large with a corresponding loss in fighting efficiency.

All this is in spite of modern methods of prophylaxis which are known to be highly efficient when properly applied. The question then becomes one of proper administration of known methods. And we know that certain of the countries from which reports have been received are models of administrative efficiency.

It is evident that the difficulty lies in the impossibility of a complete regulation of the myriad phases of the lives of men and women; of an oversight of their actions sufficiently searching to enforce proper treatment and prophylaxis among all of them.

At some time we will be forced to meet the same problem and our attitude toward it must be one of active, hopeful work along well known lines, with eyes open to its difficulties; not counseling perfection nor being downcast at failure to attain it. A great deal can be done and will be done and the many cases of disease that we will have on our hands, in spite of all our efforts, will not blind us to the fact that we would have many more but for our methods of prophylaxis.

Of the communicable diseases met with under field conditions there are a few which ordinarily give us little concern in times of peace but which take on major importance in active service. Of these cholera, typhus, typhoid, and the paratyphoids most deserve mention.

Many reports on methods of dealing with these diseases have recently been published and the main facts are doubtless familiar to you all. Certain points concerning them are worthy of special emphasis, however. Typhoid fever, we have seen, has practically disappeared under thorough immunization with vaccine. In the paratyphoids we have two diseases which still cause a considerable total morbidity, among those who have received antityphoid vaccine.

Extensive tests have been made in Europe with a quadruple vaccine containing typhoid, the two paratyphoids and cholera. The results reported are highly encouraging and seem to solve the problem in a satisfactory manner.

The diagnosis of these diseases in the field is made scientifically by bacteriological methods. For laboratory work in the field equipment is supplied that can be packed in chests loaded into wagons and transported from place to place with facility. This equipment is sufficiently complete for routine microscopical and culture work in bacteriology and ordinary chemical and water analysis and gives satisfactory results in the hands of workers experienced in adapting themselves to field conditions.

The problem in typhus is simple in theory but somewhat complicated in application. It consists, as you know, in isolation of existing cases and preventing access of lice to them and a general delousing of the soldier, his equipment and habitation and the application of the same process to the civilian population.

Many methods of removing lice from the clothing have been tried; chemicals are efficient but expensive. For instance to kill lice on the clothing of 28,000 men infested with lice and gathered together in one camp it was estimated would require four tons of bichlorid of mercury. Steam and sulphur disinfection are quite effective but each has its drawbacks. Steam requires an expensive apparatus and a highly trained personnel. It also ruins leather. Sulphur damages material and does not kill the eggs. For the disinfection of the person and clothing finely powdered naphthalene is most effective.

The ubiquity of typhus is perhaps not appreciated by all of us. According to Goldberger of the Public Health Service it exists in endemic form in New York, Philadelphia, Atlanta, Milwaukee, Chicago and Boston. It is a disease of poverty, misery, filth and overcrowding and is usually seen only in the poorest parts of these cities.

It naturally follows that epidemics of this disease in time of war would not pass us by and that compulsory louse disinfection would have to be reckoned with and must enter into any scheme of sanitary preparedness.

The importance assumed by trench warfare in modern military operations has given rise to a number of sanitary problems, some of which may be considered new, others a reappearance of old ones under new conditions. Among these are poisoning by noxious gases, burns by inflammable liquids and gases, frost bite, trench nephritis, septic infection with fecal, tetanic and gas-forming bacteria and

the results of long continued nerve strain already briefly discussed.

The so-called frost bite is rather a special condition resulting from cold, wet and tight-fitting foot and leg wear. More than 10,000 men in the British Army alone were incapacitated from this cause last winter. It is best prevented by properly fitted and adjusted shoes and leggings and the wearing of a bag of thin oiled silk between two socks.

Septic conditions are exceedingly common, due to the all pervading filth; gangrene, probably identical with the old hospital gangrene of our civil war, has been very common. At least ten organisms, different but closely allied, all anaerobic and spore bearing having been identified as concerned with this process. They are doubtless present in the soil of the trenches.

Tetanus claimed many victims early in the war. Prophylactic doses of antitetanic serum employed in all shell wounds and other cases where there is a probability of great contamination have caused its virtual disappearance. Lacerated wounds and highly manured soils are the essential factors in the production of this disease.

Trench nephritis, otherwise called war nephritis, is a rather nebulous condition. It has been observed frequently in individuals who have never been to the front or in the trenches, such as hospital attendants and men of the transport and supply departments. Some observers maintain that it is merely a nephritic tendency aggravated by the strain and hardships of active service. The weight of opinion, however, is that most of the cases observed are secondary to infection of one kind or another in which the foci of infection are in some part of the body usually remote from the kidneys. Minor infections, such as boils and abscesses, are believed to be the cause of many of them.

Among the duties of the Medical Department in the field, the securing of an uncontaminated water supply is of primary importance. Often the difficulties encountered seem overwhelming. It frequently happens that troops on the march can find nothing but stagnant pools to secure their drinking water from. Since we have known that our worst camp diseases are due to microorganisms that are in part waterborne, the necessity for some simple and efficient means of rendering contaminated waters potable has been evident.

This can, of course, be attained by the simple process of boiling, which has been tried and found impracticable. Organizations arriving in camp after a long, hot march find it impossible to restrain their men from quenching their often terrific thirst with whatever water is at hand. The time taken to build fires, boil and cool the water is considerable. And, moreover, the boiled and partially cooled water is unpalatable and most soldiers prefer to take a chance on live disease germs to drinking it.

Many devices have been tried in the last few years to find a solution to this problem. Most of them had the ability to furnish a certain quantity of pure water, but in trials under service condi-

tions demonstrated defects that rendered them impracticable. Certain fundamental faults were common to all of them and it seemed almost impossible to eliminate them. These were in general the necessity of transporting in the field a weighty and bulky impedimentum, a limited output of water, and in some types the necessity of providing fuel of some kind.

To be of any value to an army in the field any device for the purification of water must be of such a character that it can, under all circumstances, be carried into the field and be as close to the soldier as his canteen. Of what use to have pure water for nine days of a march and on the tenth day to find himself unavoidably ahead of his transportation, which carries his cumbersome sterilizers, and forced to drink bad water.

The Medical Department of our army believes it has solved this problem with the so-called hypochlorite method. A canvas bag of specially woven flax, twenty inches in diameter and twenty-eight inches in length has been devised which gives sufficient capacity to supply a company of infantry at war strength with a canteen full of water for each officer and man. The opening of the bag is sewn over a galvanized iron ring, hinged at one diameter which permits the bag to be folded. It is supported from a pole by two pieces of hemp rope about three feet long. The bag is fitted with five self-closing faucets just above the bottom seam, spaced at equal intervals. This container weighs between seven and eight pounds and can be folded up into a convenient and readily portable package; and not too large or heavy to be carried by one soldier over his infantry pack.

The sterilization of the water is carried out by adding 15 gms. of calcium hypochlorite to a bagful of water, about forty-six gallons. Sufficient of the chemical can be carried in sixty glass tubes to supply an infantry company at war strength with five canteens of water per man, daily, for twelve days. Such a package of tubes weighs ten ounces, is about six inches long and three inches wide.

Cholera, typhoid and colon bacilli are killed by this process in about five minutes. For ameba ten to fifteen minutes is required.

Since many surface waters carry considerable quantities of suspended matter, a piece of Scotch flannel (outing) has been provided for the purpose of rendering the water clearer. This is effected by placing the outing flannel over the top and filtering the water through it when filling the bag.

The presence of a proper amount of hypochlorite at all times is insured by the frequent application of the simple starch-iodine tests during the process of sterilization.

With so much difficulty in securing a supply of pure drinking water for troops in the field the necessity of avoiding waste or a consumption of water in excess of the bare needs of the soldier is evident. This can only be attained with disciplined troops and experienced officers, who know the minimum amount of water intake necessary to sustain the body during a march of a certain dis-

tance. The medical officer may be appealed to for expert advice as to this question and unless forewarned and prepared may be at a loss to give accurate and concise information to commanding officers.

The question of water supply on the march resolves itself into two parts: How much water can the body afford to lose? When and how often must this water be replaced? A man weighing one hundred and fifty pounds contains in his tissues about one hundred pounds of water. He cannot lose more than one-tenth of this, ten pounds or one gallon, without running serious risk of death. If he is in good training he can perhaps at the outside afford to lose seven and five-tenths pounds or six pints without intolerable suffering and loss of efficiency. If in poor training a loss of two and five-tenths pounds or two pints will probably produce both of these.

How much water will he lose in a march over a given distance? In a march of one mile over ordinary roads in heavy marching order the actual exertion demanded is about ninety gram calories. If the heat thus produced is to be dissipated by evaporation then for every mile 180 c.c. of water must be got rid of. In one hour's march, say three miles, allowing for ten minutes' halt, he will have lost a 540 c.c. or almost one pint. For the first mile, however, the heat produced will be utilized in raising his body temperature to the optimum for exercise, in common parlance "getting warmed up." Heat regulation will not therefore come into play until this distance has been covered. At the end of the first four miles he will have lost one pint, at the end of the seven miles he will have lost two pints, the limit of permissible loss for the partially trained soldier. In his case then it will be seen that he should be able to march seven miles, half of an ordinary day's march, without drinking. At the half-way halt he must have his first drink and after that regularly every hour of the march one pint of water. His water bottle contains a little less than two pints, so that having marched seven miles without drinking he should have a little less than a pint at the half-way halt, and the rest at the end of ten miles, after which he should be able to get home without further supply.

Suppose, however, that the soldier is in the best possible physical condition and able to endure the maximum permissible loss, six pints, he can therefore cover six times three miles, in addition to the preliminary one mile, without drinking, a total of nineteen miles. So it is safe to say that every soldier should be in condition to cover an ordinary day's march of fourteen miles without resource to his water can, if the roads be ordinarily good.

If the march be prolonged, up to twenty-five miles say, every man must have his pint or thereabouts every hour after his limit of endurance has been reached, whatever his original permissible limit of loss might be. In well disciplined organizations these results are attained by never allowing men to drink except at the word of command.

When wars are over and the demobilization of

troops takes place many important duties devolve upon the Medical Department. One of the most important of these is the supervision of troops returning from the war zone to insure against contagion being carried therefrom to the civil population at home.

Disabled soldiers must be cared for and in many cases reeducated to make themselves self-supporting in some form of industry.

Matters of interest and value for compiling the medical history of the war must be gathered together and individual records of sickness and injury gone over to adjudicate pension claims.

The title of this paper, as you will note, includes many activities of the Medical Department in war that are not touched upon this afternoon. Most of these omissions are of topics taken up by others in past or coming papers.

## IS ACUTE ANTERIOR POLIOMYELITIS SPREAD BY DIRECT PERSONAL CONTACT?

### REPORT OF AN INTERESTING INCIDENT.

By J. C. GEIGER, M. D.,

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In accordance with the long-established policy of the California State Board of Health to investigate intensively cases of acute anterior poliomyelitis, an investigation of two cases occurring in children living in Mill Valley, Marin County, California, was recently carried out. The records of the cases with the important data collected, mainly from the viewpoint of contagiousness through contact, should prove of interest to all students of the epidemiology of the disease.

*Case No. 1.* Name, M. P., age 4½ years. Dr. O. P. Stowe, physician in charge.

The history of the case is as follows: On Monday, November 27, this child was ill. There was some nausea and vomiting followed by restlessness that night. On Tuesday, November 28, the child was considerably better. On the morning of Wednesday, November 29, there was a return of the nausea and vomiting. There was some diarrhea. Temperature was evident. With some improvement of the general condition the child was allowed to attend a dancing school party that same afternoon in Mill Valley. On November 30 the patient was first seen by Dr. Stowe, mainly because of restlessness the night before and temperature which had been present. Dr. Stowe informed me that the child was nauseated, with some vomiting during Thursday. All physical signs with special reference to paralysis were negative. When seen again on Friday, December 1, the vomiting had ceased but a paralysis was noted of one-half of the tongue; the tongue being directed somewhat to

the left. There was also paralysis of the right side of the face. In the evening the paralysis of the right eyelid and side of face was very marked. There was no pain. In a telephone consultation with another physician living in San Francisco, the physicians agreed that there was some central involvement, but both were inclined to favor a diagnosis of tubercular meningitis. On Saturday, December 2, there was a paralysis of the left arm with much pain on movement. The child complained of pain when the tongue was handled and extended. The urine was negative. The throat was clear but the tonsils and the pharynx were exceedingly red. Temperature had ranged from 101 to 103.5. Dr. Stowe was advised to bring the child to San Francisco. He accordingly telephoned to St. Luke's Hospital for permission to enter the child there, and this being given, a late morning boat was taken. While on the way to San Francisco the patient asked for a glass of water. On attempting to drink some of the fluid, swallowing was evidently difficult and accompanied by much pain. There was considerable mucous flowing from the nose and mouth, the mucous being thick and ropy. Breathing at times was labored and hard.

At a consultation at St. Luke's Hospital, a diagnosis of acute anterior poliomyelitis was made. The child died at 5 o'clock that afternoon following a series of convulsions.

An autopsy was performed by Dr. G. Y. Rusk, Associate Professor, Department of Pathology, University of California. Frozen sections of the spinal cord taken through both enlargements and sections of the cord, medulla, and cortex fixed in alcohol and run through acetone showed in the cord characteristic alterations of anterior poliomyelitis. The same was shown in the medulla and in the cortical sections examined. There was a moderate infiltration also in a few perivascular spaces with exudate similar to that in the meninges.

*Case No. 2.* Name, J. C., age 2 years. On December 17 the baby was noticed to be ill. There was some fever but no nausea. There was some diarrhoea. The patient was very restless. She was seen by a physician on December 19 and 20. On the 19th it was noticed that the patient could not use the right arm. There seemed to be some pain and rigidity in the back of the neck. Dr. O. P. Stowe saw the child on December 21. There was some enlargement of the submaxillary glands but no pain on pressure. The throat was rather red. The baby would cry on handling and paralysis on the left side of the face and eyelid was plainly evident. The right arm could not be lifted and it was noted that the patient could not rest any weight on this arm. When seen on December 23, the paralysis of the left side of the face was plainly evident. There was some distinct involvement of the right arm, but as Dr. Stowe informed me not to such an extent as when he saw it two days before. The temperature was 99.5 by rectum and there was an exaggerated knee jerk on the right side. The parents informed me that the child was very much improved.

#### EPIDEMIOLOGY.

In going over the history of Case No. 1 it was ascertained that she was known to have been to San Francisco on a shopping tour with her mother a week or ten days previous to the illness. There was also a history of having played with a number of children in the playground of a large department store in San Francisco. There had been two social parties in Mill Valley to which this child had attended. There was one November 11 which was attended by a large majority of the citizens and children of Mill Valley and its vicinity. The second party, a dancing school, was attended by this child on the afternoon of the day on which she showed definite symptoms of acute anterior poliomyelitis. Various comments were made upon the paleness of the child and how badly she looked. Under these circumstances the child was handled and fondled more than usual by those present. In the party there were sixty-six other children, ranging in age from 2 to 14 years, fifty-six of whom were under 10 years and sixteen under 5. There is a distinct and definite history of this child having played with the majority, having danced with many and in some instances being kissed and fondled by the children present. There was no doubt that some used the same utensils, drinking glass, etc., along with this child. The room was not over 20 by 30 feet and there seemed to be an unusual crowd present.

Further investigation proved that in addition to the contact at the party a number of children visited the child at home and there played with her. No cases of acute anterior poliomyelitis had occurred in Mill Valley for several years, so undoubtedly this exposure constituted the first for many children present.

Accompanied by the Health Officer and Dr. Stowe each individual family was seen, the circumstances and symptom complex of the disease explained to them and their child or children placed into quarantine as contacts for a period of twenty days, according to the regulations of the California State Board of Health. One of these children came from Berkeley, two from San Francisco, and one from Sausalito. Every child known to be at the party was placed into quarantine as contacts accordingly, but the adults were allowed their freedom in every respect. In addition a letter sent to every family summarizing the above verbal instructions.

Case No. 2 was naturally exceedingly interesting because of the previous case that had occurred in Mill Valley. This family was of an entirely different social strata from the other case. They did not know the family in which the first case had occurred. They lived at least a mile to three-quarters of a mile apart. The water supply was the same as supplied to the city of Mill Valley. The mother does her own laundry on the premises. The milk supply was not in common. The contacts to the other case were not out of quarantine when this case came down.

These two cases are an interesting contrast; different social strata; no known knowledge of

each other; no possible contact with each other; no food supply in common, except water, which is the general supply, and no possible contact of the second case with the contacts of the first case. Flies can only be considered a negligible factor as they are not present at this period of the year.

Mill Valley was visited on different occasions during the period of quarantine and there was not one recorded instance in which the regulations put in force were violated. All the children remained remarkably well. The quarantine of the contacts of Case No. 1 was terminated on December 23, 1916, and there have been no further cases reported.

#### CONCLUSION.

Therefore taking everything into consideration relative to the sixty-six close contacts of Case No. 1, particularly their supposed susceptible ages with the subsequent negative clinical results and especially since, for the majority, it undoubtedly constituted a first exposure to the disease, there seems to be sufficient reason to doubt the accepted present-day theory of the spread of acute anterior poliomyelitis by direct personal contact.

### THE FALLACY OF POST-VACCINATION TETANUS DUE TO VACCINE VIRUS.

By J. C. GEIGER, M. D.,

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In a study of cases of tetanus following vaccination against smallpox, Elgin<sup>1</sup> plainly points out that tetanus is the most important complication of vaccination, and largely preventable. An investigation of a case of post-vaccination tetanus recently occurring in San Francisco should add emphasis to the need and importance of follow-up care in vaccinated persons.

*The History of the Case:* Name, E. C., age 6 years 10 months. San Francisco, Cal. Dr. N., physician in charge.

The child was vaccinated according to what is known as the cross-scarification method on July 23, 1916, by Dr. N. Dr. N. informed me that the arm was sterilized first by washing with soap and water, then with a weak solution of bichloride with the later use of alcohol and further cleansing of it by sterile water. This was the primary vaccination of the child. A vaccination shield was used over the fresh wound. This was then covered by a sterile bandage. The child was requested to come back for observation in five days. The reason for vaccination as given by Dr. N. and also by the parents was that the child intended to enter school at the beginning of the fall term, somewhere near July 28.

*Result and Character of Vaccination:* The patient was not seen again until two weeks after vaccination. There was no scab. The underclothes were adherent to the wound. Some parts of the original dressing, partly on and off, re-

mained. This was very dirty and soiled. There was not much pus present. The area of inflammation around the wound was as large as a silver dollar. The wound was freshly cleansed and sterile dressings applied.

*Date of Onset of Symptoms of Tetanus and Summary of Symptoms:* When seen again, August 12, the arm was very much inflamed. The wound was again cleansed and sterile dressings applied. The parents were requested to bring the child back the following day. She was not seen until the evening of August 13. At this time there was some stiffness of the vaccinated arm as well as rigidity of the muscles of the neck. The temperature was 101 F. by mouth. It was impossible for the child to open its mouth even after urging. She was then sent to the French Hospital and the records of the hospital show she was admitted on the evening of August 13, 1916. That same evening, 3000 units of tetanus antitoxin was administered subcutaneously. This dose was repeated on the morning of August 14. Three thousand units of anti-toxin was administered on the evening of the same day and again repeated four hours later. The highest temperature recorded was 101.8 by rectum. Then the pulse ratio was 132, respiration 30. Other palliative treatment was used during the course of the disease. The child died early on the morning of August 15. The symptoms of the case were typical and a diagnosis of tetanus was justified.

*Vaccine Virus:* Dr. N. informed me that there had been vaccinated approximately fifteen to twenty other persons along with this child, including the sister of the patient. There was no history of illness of any kind whatever in those vaccinated except in the case under discussion. The same vaccine virus was used in all cases as far as the physician knew. A sample of the virus used in the vaccination of this child was obtained. Investigation of the laboratory records at the time of manufacture showed the vaccine to be free of contamination with tetanus. Thirty-three thousand five hundred and eighty vaccine points of this particular set of virus were shipped for distribution.

#### DISCUSSION.

The father of the patient works in a South San Francisco packing company as a fireman in the engine room. From the mother it was learned that the child was playing freely the day before the onset of the symptoms of tetanus, August 13. Pain in the neck was the first symptom noticed. There was a stable across the street from this house in which horses were kept. There was some manure scattered about the yard. The boy of the family in whose yard the stable was located played with the child quite often. There is a fairly reliable record of this child playing in the stable yard. As far as it could be learned, though not definitely ascertained, the scab was removed or knocked off of the wound two or three days before she became ill.

From the records of the French Hospital as well as personal communication from Dr. N. and the parents the onset of symptoms of tetanus in

this patient was undoubtedly August 13, twenty-one days after vaccination. This would probably indicate a late infection should one consider the vaccine virus the immediate and only cause. On the other hand, Anderson<sup>2</sup> has shown that in post-vaccination tetanus the average incubation period, measured from vaccination to the onset of symptoms is 20.7 days with the average mortality of 75.2%. This high mortality rate is similar to that in cases of tetanus with an incubation period of ten days or less. Therefore it is evident that if the onset of symptoms are more than ten days after vaccination, as in this patient, it is most probable and very possible that the infection was not received through the virus used in vaccination.

Summarizing the evidence gathered relative to this case, one could easily consider that the infection was due entirely to lack of care of the wound with a direct responsibility placed upon the parents of the child. The proximity of the stable is interesting. Therefore this case is a fair illustration of the fallacy of post-vaccination tetanus supposed to be due to direct contamination of the vaccine virus in its manufacture.

#### References.

1. "Accidents Following Vaccination." W. F. Elgin. American Journal of Public Health, Vol. 5, No. 9.
2. "Post-Vaccination Tetanus, Studies on Its Relation to Vaccine Virus," by John F. Anderson, Director, Hygienic Laboratory, U. S. P. H. S. Reprint No. 289, Public Health Reports, July 16, 1915.

### DEATH DUE TO STATUS LYMPHATICUS FOLLOWING AN INJECTION OF DIPHTHERIA ANTITOXIN.

By WM. C. HASSLER, M. D., Health Officer,  
San Francisco.

On January 3, 1917, the San Francisco Department of Health was requested by the family physician of X. to administer a prophylactic dose of diphtheria antitoxin to Thomas X., age 7 years, who had been in contact with his sister who was at the time ill with diphtheria and who had been removed to the city's Isolation Hospital.

To comply with this request Sanitary Inspector Dr. C. of the Board of Health proceeded to the family residence of X., found Thomas to all appearances a normal, healthy child, and with the assistance of the mother, the inspector cleansed with warm water and soap the right scapular region of the boy's back, then painted the site of the injection with tincture of iodine and injected subcutaneously 1000 units of diphtheria antitoxin of a standard brand, the time of its potency guaranteed to November, 1917.

The sanitary inspector left the house some ten minutes after the injection. At the time of his leaving there were no symptoms of collapse. The child complained of pain at the site of the injection, and ten minutes later he was seized with violent cramps, had great difficulty of breathing and passed off in what the mother called a "severe convulsion."

A postmortem of the body was made by Dr. William Ophüls, Professor of Pathology in the

Leland Stanford University Medical School, and the following were the necropsy findings:

Name, Thomas X. Age, 7 years. Died, January 3, 1917.

History: Died in 20 minutes after subcutaneous injection of 1000 units diphtheria antitoxin.

Examination: Strongly built, well nourished boy about 7 years. Plentiful, dark blonde hair; eyelid lashes, eyebrows darker. Marked cyanosis of face, neck, shoulders, upper part of arms and finger tips. Skin light, thin and few small freckles over nose. Cervical lymph glands just palpable, also axillary and femoral glands. Teeth show two permanent incisors in upper jaw; large and widely separated permanent canines; four incisors in lower jaw. Teeth well preserved and kept. Large amount dark, venous blood in veins of neck. Moderate layer of subcutaneous fat; muscles well developed, natural color.

Peritoneum shows slight passive congestion, moist in character. Few drops of clear fluid in recto vesical pouch. Appendix long, twisted, otherwise normal. Considerable fat in omentum. Position of the abdominal organs is natural.

Lymph-glands in ligamentum gastro-colicum about the size of split peas. The glands of the mesentery are more definitely enlarged; about the size of small lima bean, light grayish red in color.

The chest wall is arched and symmetrical.

Diaphragm is attached at the level of the fifth rib on both sides. There is evidence of old adhesions between the anterior part of the right lung and sternum.

Thymus and Thyroid Glands: The thymus is attached to the anterior part of the right lung, which overlies it. It extends up in front of the trachea for a considerable distance, almost to the lower end of the thyroid gland. Dimensions 11.5 cm. by 6 cm. by 1 cm. Thyroid gland is of normal size and appearance.

Lungs: Both lungs are much inflated with air, and quite emphysematous at free margins, covering pericardium and thymus glands almost entirely. The left lung is excessively distended with air throughout. Marked cyanosis of bronchial tubes. The air does not escape as readily as usual from lung parenchyma. Posterior portions are much congested. There are no visible scars. Right pleura is entirely obliterated by easily broken adhesions. Right lung is similar to left.

Heart: There is about a tablespoonful of clear fluid in the pericardium. The left ventricle is in systole. The right is also collapsed. Heart contains small amount of fluid, dark, venous blood; no air. The pulmonary artery is filled with dark fluid blood; the blood is everywhere liquid and shows no sign of clotting. The heart-muscle on the right side thin and flabby. Left side normal thickness, pale, firm, slightly opaque. Valves normal save for a yellow spot on the large flap of the mitral. Aorta and coronaries normal.

Spleen: Normal in size; capsule wrinkled. Cut surface shows an enlargement of the Malpighian bodies, measuring about 2 mm. in diameter.

Kidneys and Adrenals: The left adrenal shows bright yellow cortex, rather small, otherwise normal. Kidney is of normal size; capsule strips easily. The cortex shows normal markings, pelvis normal. Right adrenal and kidney same as left.

Stomach: Stomach contains a large amount of partly digested food, in which there is considerable curdled milk. Mucous membrane covered with thin layer of mucous. Shows distinct of lymph follicles; numerous, the largest one 2 mm. in diameter.

Pancreas: Normal.

Gall Bladder: Contains thin usual bile, otherwise normal. Bile duct patent.

Liver: Liver normal size, and surface shows passive congestion, otherwise normal.

Genitalia: Both testes in scrotum of normal

size. Penis well developed shows marked phimosis; impossible to push gland through opening in the very long prepuce.

**Intestines:** Duodenum contains some turbid mucus. The small intestines contain a considerable amount turbid, bile-stained mucus. Small amount of normal soft stool in cecum. The rest of large intestines contain small amount of mucus. Some liquid stool in sigmoid flexure. Mucous membrane of jejunum slightly swollen, of light cream color, evidently due to a beginning absorption of chyle. Peyer's patches in lower small intestine slightly swollen and congested. There are many small lymph glands at the mesenteric insertion. Considerable enlargement of the lymph follicles of Peyer's patches, especially well marked in the region of the ileo-cecal valves.

Lymph follicles all through the large intestines are numerous, enlarged; largest being 3 mm. in diameter. There is a polypus about 3 mm. long by  $1\frac{1}{2}$  cm. in diameter in the region of the splenic flexure.

**Lymph Glands:** Bronchial lymph-nodes grayish red color, size of small beans; there are a few slightly enlarged lymph nodes at hilus of the spleen. Glands in the mesentery of transverse colon enlarged moderately. There are a few very large glands in the mesentery in the region of the ileo-cecal valve.

Retroperitoneal and mediastinal glands not enlarged. There are large grayish glands in both submaxillary regions. The glands in the lower part of the neck only moderately enlarged and there is a marked enlargement of them at the base of the tongue and moderate enlargement of them in the anterior wall of the pharynx.

**Tonsils:** Moderate size; uvula markedly edematous. Larynx and trachea show passive congestion.

**Aorta:** Aorta normal.

**Brain:** The longitudinal sinus is normal, contains some fluid blood. The pia mater shows marked passive congestion. The large blood vessels at the base of the brain are normal. The brain substance is moist; shows passive congestion.

**Diagnosis:** Pathological—Status Lymphaticus.

From the above it will be noted that the enlargement of the lymph-glands throughout the body was general together with a persistent and markedly enlarge thymus gland.

The cause of the sudden death is attributed to the condition of status lymphaticus in this boy, one among thousands, and which could not stand antitoxin.

It is interesting to note that on the day previous the sister of this boy, who was the active case, had received intravenously 20,000 units of the same antitoxin and on the following day in the same manner an additional dose of 10,000 units, and made a complete recovery.

This unfortunate case has not deterred the department's use of antitoxin, either as a curative or prophylactic measure, but it has brought its lesson, which may be of value to other Health Departments, not in the prevention of death in such cases, but the avoidance of criticism.

The Board of Health now requires:

First, the written consent of parent or guardian to administer antitoxin.

Second, the Sanitary Inspector must remain with the patient or the contacts not less than one hour after its administration.

## TYPHUS FEVER IN CALIFORNIA.\*

By JAMES G. CUMMING, M. D.,  
Director of the Bureau of Communicable Diseases,  
California State Board of Health.

Typhus, typhoid and relapsing fever were not differentiated until in Ireland in 1829 a distinction was made clinically between typhus and relapsing fever, and it was eight years later that Gerhard defined the clinical and pathological differentiation between typhus and typhoid. The discovery of the spirillum of relapsing fever by Obermeier in 1868 and the typhoid bacillus by Eberth in 1880 definitely established the etiological differentiation between these two diseases and their non-identity with typhus fever.

During early civilization typhus fever was the predominant disease; whereas typhoid was of secondary prevalence. With the advancement of civilization, however, and the adoption of higher standards of personal hygiene, typhus has receded. On the other hand, with the growth of large cities and the resulting contamination of food and water supplies, typhoid has become pandemic.

Except under war conditions, epidemics of typhus are now rare, although the disease is endemic on the Great Plateau of Mexico, in parts of Ireland, France and Russia, in Algeria, Egypt, Hungary and certain provinces of the Balkan States. As a result of war conditions the recent Servian epidemic, which for a time claimed as many as five hundred lives per day, is still fresh in our minds.

The three chief visitations of this disease to the United States were in New York in 1881 and 1882, and again in 1892 and 1893, and in Philadelphia in 1883. Sporadic cases have not been uncommon at our seaports. Furthermore, it has been recently shown that the symptom-complex known as Brill's disease is in reality typhus fever. In 1909 Dr. Nathan E. Brill reported two hundred cases of an acute infectious disease of unknown origin observed by him in the wards of the Mount Sinai Hospital. He had previously reported seventeen cases of the same disease. The important phases of the disease are summarized by Brill as follows:<sup>1</sup> "An acute infectious disease of unknown origin and of unknown pathology characterized by a short incubation period (four to five days), a period of continuous fever, accompanied by intense headache, apathy and prostration, and profuse and extensive erythematous maculo-papular eruption, all of about two weeks duration, whereupon the fever abruptly ceases either by crisis or by rapid lysis within three days, when all symptoms disappear."

When Brill's second paper appeared in 1910,

\* Read before the Stanford Clinical Society, November 6, 1916.

Anderson and Goldberger of the United States Public Health Service had recently returned from the City of Mexico where they had been making a study of Mexican typhus or "tabardillo."<sup>2</sup> These investigators were impressed with the similarity between the disease described by Brill, and typhus fever as observed by them in Mexico. They were given the opportunity of drawing blood from a case of Brill's disease in the wards of the Mount Sinai Hospital. This was inoculated into monkeys. One of these animals, after an incubation of ten days, developed a fever which reached its maximum six days later and fell by rapid crisis fourteen days after the rise began.

To determine the relationship of Brill's symptom-complex to typhus fever, these workers tested the susceptibility of animals that had recovered from Brill's disease to Mexican typhus, and the converse of this. It was found that an attack of Brill's disease in the monkeys conferred immunity to Mexican typhus, and that Mexican typhus conferred immunity to an attack of Brill's disease. It was thus shown that Brill's disease, so-called, and typhus are identical.

Since the endemic typhus of New York, with which Brill worked, is of European origin, it may be concluded that the typhus fever of Europe and that of Mexico are identical.

Cases of continued fever of more than seven days' duration were studied from the records of the Massachusetts General Hospital, and from this investigation Roger Lee concluded that Boston and vicinity gave a ratio of one case of typhus to forty-seven of typhoid, a proportion probably present in most of the Eastern coast cities. Moreover, cases are reported as far west as Chicago and Milwaukee. There were thirty-six cases of typhus treated at the Mount Sinai Hospital and nineteen at the Jewish Hospital in 1912. With a more accurate identification of this disease it is evident that it has not disappeared from the United States, but, on the contrary, it has been present more or less continuously, especially in the large Eastern cities, since the epidemics of the eighties and nineties.

#### TRANSMISSIBILITY.

In the latter part of 1909, Nicolle infected an African ape with the blood drawn from a human case of typhus. Shortly after this announcement he reported the successful transmission of typhus from an ape to a monkey by the bite of the louse (*Pediculus vestimentum*). From the epidemiologic conditions which prevailed in Tunis, he was able to rule out the flea and the bedbug as carrying agents. In February, 1910,<sup>4</sup> Anderson and Goldberger reported the transmission of typhus from a human case to a monkey by means of the body louse. Other experiments with fleas and bedbugs were negative and those with head lice—*Pediculus capitis*—though suggestive, were not conclusive. During the same year Ricketts and Wilder transmitted typhus to a monkey by the bite of the body louse in two experiments. In one instance the virus was transmitted from man to monkey, in the other from monkey to monkey. Furthermore, these investigators infected a monkey with typhus through the introduction of the abdominal contents of in-

fecting lice through small incisions. The achievements of Nicolle and the confirmation of his findings by other workers have demonstrated the mode of transmission of typhus fever and made plain the practical methods of preventing the disease. These, when intelligently applied, have worked remarkable results. Thus, according to Nicolle, in 1909 there occurred in Tunis 838 cases of typhus fever, but in 1912, after the efforts to control the disease in the light of recent research had been put into effect, there occurred only 22 cases. The only prophylactic measure resorted to was the destruction of lice found on persons and their clothing in the vicinity of patients suffering from typhus. The successful campaign of the American Red Cross, under the leadership of Dr. Richard P. Strong against typhus among the Servian troops by the use of the crude oil bath and the steam sterilization of clothing is a remarkable achievement based primarily on the results of Nicolle's original investigations.

The theory that the body louse is the transmitter of typhus has received ready support from students of the epidemiology of this disease, for it presents the characteristics of an insect-borne disease. Typhus fever prevails in epidemic form only in overcrowded, filthy surroundings. To quote from Hirsch, "The history of typhus is the history of human wretchedness."

It is reported that in Mexico thousands are dying of typhus fever. The civil war in that country, with the accompanying wretchedness bordering on starvation, has led many of the inhabitants to emigrate to the United States. California has been free from typhus for years until the last four months, during which time there have occurred twenty-six cases, twenty-four of which we had the opportunity of investigating. Owing to the fact that all these, with the exception of one, were foreigners, it was difficult to obtain an accurate history of subjective symptoms. Furthermore, our chief work as representatives of the State Board of Health was to institute preventive measures.

In general it may be said that prodromal symptoms were absent or insignificant. In about half the cases the fever was ushered in by a chill. The rise in temperature was rapid, reaching its height about the third day. Mild delirium, muscular weakness and intense headache were early symptoms. With the rise in temperature, the face became flushed, the conjunctivæ became injected, and conjunctivitis developed later. There was no coryza or sore throat; there was hemorrhage from the nose and ears in only one case, and that late in the disease. A mild cough, moist bronchial rales, were not uncommon early symptoms. As the fever reached its height, there appeared within a couple of days the typhus rash, first on the abdomen, then on the chest, back, arms, thighs, forearms and legs. Within thirty-six hours it was fully out and remained until recovery or death. The spots vary in size, from 1/10 to 1/2 inch in diameter. They were irregular and had a fairly distinct outline but were not perceptibly elevated. The rash may be referred to as a mulberry rash during the first few days when it will disappear on pressure and

as a maculo-petechial rash when it becomes dark-brownish and does not disappear on pressure. As shown by Von Franckel, the characteristic exanthema is primarily a periarteritis which leads to stenosis and, by thrombosis formation, to circumscribed disturbances of the circulation, and to interstitial hemorrhages which convert the inflammatory roseola into petechia. The interstitial hemorrhages prevent the disappearance of the typhus spots on pressure.

The fever reaches its maximum in about three days, remaining elevated at  $103^{\circ}$  to  $104^{\circ}$  without marked morning remission for about fourteen days, at the end of which time it falls by crisis or rapid lysis. As stated by Dr. C. C. Pierce of the United States Public Health Service, "the most dependable symptoms are the rash, headache, bronchitis, mental confusion, dry coated tongue, nervous tremor and continuous fever." From eight of the cases investigated by the State Board of Health blood was drawn and injected into guinea pigs. As in two of the cases blood was drawn after the crisis, no temperature was produced in the animals inoculated from these. In the other six, the guinea pigs developed, at the end of an incubation period of ten to twelve days, a temperature which persisted for from four to twelve days. All the strains of typhus fever so isolated are now in the fourth generation.

The disease is not fatal in guinea pigs; an elevation of temperature and slight indisposition are the only signs of illness, and there are no distinct lesions such as we have noted in the spotted fever guinea pigs now in the eightieth generation at the State Hygienic Laboratory.

#### TYPHUS FEVER IN CALIFORNIA AMONG NEWLY ARRIVED MEXICANS.

The Mexican peons are said to be the only labor available at present for American railroad construction. Two employment agencies of Los Angeles furnish all the Mexican labor for the California railroads. After inspection by the United States Public Health authorities, the peons are recruited in El Paso, from whence, up to the time of the investigation by the State Board of Health, they were indiscriminately distributed in the various camps of the railroads. This method of distribution has been discontinued and in its place the following procedure has been established in accordance with the regulations adopted by the State Board of Health: When the peons, having passed the United States Public Health inspection, enter the employment of the railroad, they are sent, for the first fifteen days, to observation camps. These are isolated from other camps, and although the men are permitted to work within the section limits of such camps, they are thus placed in provisional quarantine for the fifteen-day incubation period, and are readily supervised from a medical standpoint.

All the twenty-six cases of typhus, with two exceptions, have been among newly arrived Mexicans or their families. All these laborers with four exceptions, developed the disease within seventeen days after departing from Mexico. Presumably then, the infection took place in their native country. Prior to our investigation the newly arriving

Mexicans at the construction camps were infested with lice. The recent activities of the United States Public Health Service in inspecting all emigrant Mexicans upon entrance to the United States, has reduced this lousiness to a minimum. The inspection, however, of thirty-two peons who had been deloused at the border revealed the fact that at least two had body lice. Obviously, delousing at the border, if the emigrant is taken to a louse-infested camp, will not prevent re-infestation.

The first inspection of section camps by this Bureau during the week of September 18th showed that a large percentage of the men—especially recent arrivals—had body lice. Under such favorable conditions for the spread of the disease it was evident that louse eradication measures were necessary. The recent arrival in the incubation stage would readily become infested and the delousing measures now instituted at the border would be robbed of their purpose. In order to put into immediate operation eradication measures at all section camps, the following circular, initiative to the control and prevention of typhus fever, was issued on October 4th to the railroads operating in this state.

#### REGULATIONS OF THE CALIFORNIA STATE BOARD OF HEALTH FOR THE PREVENTION OF TYPHUS AMONG RAILROAD EMPLOYEES.

During the past six months every case of typhus fever reported in the State of California, with one exception, has occurred in railroad camps; in view of this fact the State Board of Health deems it advisable and hereby gives notice to all railroad companies operating in this state, that they must instruct the foremen of their section gangs (1) to carry out the following regulations; and (2) to supervise a repetition of a compliance therewith by every man, woman and child in the camp every seven days; and to report thereon once a week:

##### REGULATIONS.

*First.*—Have all bedding boiled. Have such as cannot be boiled removed from the bunkhouses into the open air and have it thoroughly shaken and brushed. This includes all clothing. Before returning any bedding whatsoever to the bunkhouses or living quarters, have all bunks and living quarters thoroughly swept and mopped with equal parts of coal oil and water.

*Second.*—Bathe the head and entire body with equal parts of coal oil and warm water. The coal oil and water to be thoroughly rubbed into the skin, especially over the hairy parts of the body. After the thorough rubbing, the coal oil may be removed by rubbing with a dry towel, or by taking a bath with warm water and soap.

*Third.*—After the coal oil bath, put on fresh clean clothing.

*Fourth.*—Boil all clothing as soon as removed from the person.

*Fifth.*—When the bathing is in progress have the shoes treated as follows: Dip them into gasoline until they are completely covered both inside and outside and then allow them to drain and dry in the open air. In using gasoline, guard against fire at all times.

*Sixth.*—Wash down all toilets with coal oil, especially the seats and bowls.

*Seventh.*—All garbage and refuse should be stored in containers until properly disposed of by burning or by burying.

*Eighth.*—Every foreman must supervise the carrying out of these regulations throughout the camp every seven days.

*Ninth.*—All instances of illness must be immediately reported to the railroad physician and no case definitely diagnosed as typhus or simulating typhus shall be removed from the camp without authority from the county health officer.

REGULATIONS PERTAINING TO THE ESTABLISHMENT OF OBSERVATION CAMPS FOR MEXICANS NEWLY ARRIVED AND ON THE PAYROLL OF THE RAILROAD COMPANIES.

The eradication of the body-louse is imperative for the prevention of the spread of typhus fever. Owing to the great prevalence of typhus in Mexico at the present time and owing to the undisputed probability of infection among the Mexican emigrants prior to their entrance into the United States, it is necessary that one or more camps be established for the observation of such new arrivals for a period of fifteen days in each case and that these camps be established apart from all other floating or fixed camps.

All regulations hereinbefore mentioned in this circular apply in full force to these observation camps also.

All men in such observation camps are hereby not prevented from engaging in work for the railroad within the section limits of such observation camps during the period of observation.

REPORTING ON NEW ARRIVALS.

Each railroad company shall immediately report to the State Board of Health the names and location of all newly arrived Mexicans as soon as they are placed on the payrolls of the company.

There have been no new cases of typhus reported since October 2nd. Such a result in controlling the disease may be considered as due to the co-operation of the following factors: (1) The United States Public Health Service which has supervised the delousing and inspection of all emigrant Mexicans at El Paso, Eagle Pass, Laredo and Brownsville. (2) The railroads of the State which have established quarantine camps at various points under State Board of Health supervision for the detention of newly arrived Mexican labor in such camps until the period of incubation shall have ended. Also, their issuance of posters, explanatory of the state's delousing regulations printed in English and Spanish for distribution in all section camps, and their compliance with the state regulations regarding the delousing of all Mexican section labor camps. (3) The state-wide inspection, and in part reinspection, of railroad Mexican labor camps by the State Board of Health.

References.

1. American Journal Med. Science, Philadelphia and New York, 1910, xxxix, 484-502.
2. United States Public Health Reports, April 30, 1915, p. 1304.
3. Compt. Rend. Acad. des Sciences, vol. 149, July 12, 1909, p. 157.
4. United States Public Health Reports, Feb. 18, 1910.

INTESTINAL INFECTION IN THE SACRAMENTO VALLEY.\*

By F. F. GUNDRUM, M. D., and NATHAN G. HALE, M. D., Sacramento, Cal.

During the past six years we have repeatedly heard the opinion expressed by medical practitioners in and about Sacramento that typhoid fever was less severe in the valley than it was in the eastern states. Various reasons have been assigned for this alleged peculiarity of the disease, such as climate, habitual quinine taking, so common along the rivers, infection during childhood and the efficacy of various methods of treatment. Upon taking over the medical service of the Sacramento County Hospital, we soon found that we did have a true typhoid infection of usual severity with hæmorrhages, perforations and all the major and minor complications of this disease. Our average yearly number of these was about 75. On the other hand, perhaps 60 patients a year were admitted who "looked like typhoid" yet whose later clinical course was very different from the classical typhoid fever. It seemed likely that a relatively high proportion of the milder intestinal infections might have some bearing upon the cases. For two or three years we had intended to undertake some sort of investigation of this problem. Unfortunately the opportunity did not come until 1915, during which year the City of Sacramento began chlorination of the river water, whereafter our yearly group of intestinal infections promptly dropped in numbers from the usual 100 to 150 to about 40, 37 of which we can present to you to-day. The method of investigation was a series of agglutination tests against seven of the common intestinal invaders, pure cultures of which were kindly supplied by the State Hygienic Laboratory at Berkeley. The organisms used were B. Typhosus; para typhoid A. 7; para typhoid B. Homo; colon; para colon; dysentery Shiga, and dysentery Flexner. The dilution of the serum was one in 40, the preparations were allowed to stand one hour. The microscopical method was used. Several sera for controls were obtained from patients suffering with various other diseases. These were used for the purpose of checking up our organisms.

*Results:* Of 37 patients who "looked like typhoid" upon admission 20 (54%) agglutinated the typhoid bacillus; 7 (19%) agglutinated para typhoid B. Homo; 1 (3%) para colon and 1 (3%) dysentery (Flexner); no blood agglutinated para typhoid A. 7, colon or dysentery (Shiga). There were 8 (21%) in which none of the 7 organisms were agglutinated. Controls in which no agglutination occurred were nephritis; alcoholic gastro enteritis, 2; pleurisy, 1; pneumonia, 1; tuberculous meningitis, 1; cancer of bowel, 1; acute alcoholism, 1. The different groups were analyzed and tabulated for some of the commoner typhoid difficulties; namely, duration, maximum

\* Read before the Northern District Medical Society April 18th, 1916.

temperature, maximum pulse, delirium, hemorrhage, perforation, rash, chills, and mortality.

Type	Duration days	Max. temperature	Max. pulse	Delirious	Haemorrhages	Perforation	Rash	Chills	Died
Typhoid .....	26.8	103	113	40%	15%	10%	50%	60%	10%
Para Typhoid B. (Homo).....	14	102	107	0	0	0	28%	28%	
Para Colon.....	5	102	110	0	0	0	0	0	
Dysentery (Flexner).....	7	102	110	0	0	0	0	0	
Dysentery (Shiga).....	6	0	0	0	0	0	0	0	
Colon .....	0	0	0	0	0	0	0	0	
Para Typhoid.....	0	0	0	0	0	0	0	0	
None agglutinated.....	15	102	110	0	0	0	0	20%	

Dilution 1/40—1 hour.

#### CONCLUSIONS.

(1) Only a little more than half of our patients who came in "looking like a typhoid" gave an agglutination to the typhoid bacillus.

(2) Of this group the average duration of fever was 27 days, 40% were delirious, 15% had hemorrhage, 10% perforations, 50% rose spots and 10% died.

(3) 19% agglutinated para typhoid B. Homo.

(4) On this group duration of fever was 14 days, delirious none, hemorrhage none, perforation none, rash 28%.

(5) 3% (one case) agglutinated para colon and 3% dysentery of Flexner.

(6) 21% did not agglutinate any one of the seven organisms used.

(7) In this group duration was 15 days. There were no complications.

(8) Our "mild typhoids" were in about 1/2 the cases something else.

#### THREE CASES OF BERIBERI.

By ALFRED C. REED, M. D., San Francisco,  
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Medical School.

Three cases of beriberi have been under observation recently in the Stanford medical service. These have been in no wise atypical but their occurrence shows that this disease is to be considered in California as well as in more endemic areas. There is no reason why it should not appear here if conditions of diet and hygiene are satisfactory for its development.

*Case I.*—(The first two cases have been reported in detail in the *Journal of the American Medical Association* (Jan. 13, 1917), and abstracts only are included here.) Lung Foo Sing, a Chinese man of 42 years, complained of tiredness and numbness of the legs. The condition was of gradual onset, progressive and first noted some six months before. Family history was unimportant. There were no symptoms referable to the respiratory, circulatory or gastro-intestinal systems, nor was there history or evidence of venereal infection. He had been in the United States for thirteen years, having visited China for more than a year just before the onset of symptoms.

Examination showed a slight cardiac irregu-

larly after exercise, a slight pre-tibial edema, and numbness of both legs below the mid-thigh. A definite but mild peripheral neuritis was demonstrable. The diagnosis rested on the above findings, combined with an absence of fever, albuminuria and other cause for the polyneuritis. He had been exposed to beriberic conditions and his improvement was steady on a proper diet and an iron tonic. A silent tuberculosis could not be positively ruled out but would not have accounted for the full clinical picture, even if present.

*Case II.*—K. Saito, a Japanese man of 44 years, had been a domestic in the United States for twelve years, with no return to the Orient. He complained of headache, palpitation, insomnia and digestive disturbance. He suffered from dental caries and pyorrhea, had some cardiac hypertrophy with no decompensation and a moderate arterio-sclerosis. Systolic blood pressure was 165 (Faught). There was a deep pre-tibial edema and well-marked peripheral neuritis. The blood picture was not unusual. The stool showed a heavy clonorchis infestation. In the urine was a slight trace of albumin. On examination of the spinal fluid, a suspicious increase of globulins was noted but after a provocative injection of arsenobenzol, the fluid was normal in globulins, cells and Wassermann reaction. The renal excretion of phthalein was 85%.

Here the cardiac findings, edema, lack of fever and decided albuminuria, and a polyneuritis, pointed to beriberi. The low grade nephritis, arterio-sclerosis and pyorrhea do not seem responsible for the major condition. This man like the former had been exposed to a beriberic diet without however leaving the United States. The clonorchis infection seemed to have no bearing on the clinical condition.

*Case III.*—Leong Kee, a Chinese man of 25 years, complained of atrophy and paralysis of all four extremities. He was born in Kum Ling, a village near Canton, China, where he spent the first fifteen years of his life. As a child he frequently suffered from abdominal pain, but this is a common heritage of all Chinese children and is not significant. He had no fever or acute illness. His father and mother both died when he was about five years old. The patient was the eighth of ten children, all of whom are living and well except one who died in infancy.

The patient never did any work in China as he was a student. His diet there was the ordinary one of the country, in which the staple was the usual yellow rice, which was not highly polished. At the age of 15 years he went to San Francisco where he clerked in a Chinese grocery, after several years spending two years at the same trade in San Jose. While nominally a groceryman, he was really a lottery collector. Returning to San Francisco he lived there until March, 1916, when he went to Alaska for employment in the construction of tin cans in a salmon cannery. There his diet was chiefly Chinese imported dry foods, and fresh fish. Once in two weeks he was allowed beef, pork or bacon. The main article of diet was Hongkong rice. He returned from Alaska in September, 1916. It was during the

Alaskan trip that the condition arose which brought him to the hospital.

His habits were not different from the average of his class. For four years he smoked opium excessively, breaking the habit on his return from Alaska in September, 1916. This was accomplished by a Chinese cure consisting of the decoction of the dried residue in opium pipes, which was drunk when the drug desire was strong upon him. The interpreter stated that he had the characteristic appearance which by the Chinese was associated with an opium habitue, namely, "emaciation and black lips." The patient had used alcohol to some extent, as Chinese and American wine and occasionally a drink of whisky. He had been drunk some three or four times. He smoked cigarettes constantly.

The present illness began in Alaska in the early part of August, 1916, with a progressive weakness of the legs and arms, which soon prevented him from working. He then began to have sharp, cramp-like pains in the extremities and much formication. On two separate occasions near the onset, he had decided swelling of the legs which each time lasted from two to three days. At times he suffered much from cardiac palpitation. The weakness and paralysis progressed until he was helpless and was brought to San Francisco in September, 1916.

Examination showed a very emaciated, thin, weak Chinese man, lying helpless in bed. His skin was dry. He had complete wrist and foot drop. The pupils were regular, the left a little larger than the right, and both reacted to light and accommodation. The eye motions were normal. The mucous membranes were pale. There was no deviation or tremor of the tongue. The teeth were in poor condition and subject to caries and pyorrhea. There was a pigmented line about four millimetres from the edge of the gums, which was not a lead line. The right chest was more prominent. The lungs were resonant and no rales appeared.

The apex of the heart was in the fourth left space just outside the mammillary line and 9.5 cm. from the meson. No dullness was found to the right of the sternum. There was a soft systolic murmur at the apex, not transmitted. The second sounds were clear. The pulse was regular, even after some exertion, of moderate tension and the vessel walls were palpable. The abdomen was somewhat distended and tympanitic. No organs or masses were palpable. The epitrochlear glands were palpable, as is common in this race.

Examination of the nervous system showed complete foot and wrist drop and anesthesia to touch and pain in the palms and below a point just above the knees. The Kernig sign was present. No stiffness of the neck was demonstrable. The muscles especially of the forearms and calves showed a decided atrophy. There was deep pain on pressure on the calves and arms. Patellar and Achilles jerks were absent. Temperature sense was not lost. There was a marked retraction of degeneration in the calf and peronei, and in the extensor muscles of the forearms.

The cause of the polyneuritis seemed to lie

between alcohol, arsenic and beriberi. The first was hardly supported by the history and the second was excluded by the history. The finding of a right ventricular hypertrophy by the cardiograph, the definite exposure to beriberic conditions, the history of edema at the onset and the absence of a better explanation for the neuritis seemed to justify the diagnosis of beriberi.

The laboratory findings were as follows: Urine showed a faint trace of albumin, no sugar, indican present, a few leucocytes, no red cells, a few hyaline and an occasional granular cast. The blood contained 4,700,000 red cells, 80% hemoglobin by Haldane method, 8500 leucocytes of which 73% were polynuclear, 25% were lymphocytes and 2% were eosinophiles. The stools showed ova of trichocephalus and clonorchis. The Wassermann reaction was negative in both blood and spinal fluid, the latter having normal cytology and no increase of globulins.

All three of these cases showed decided improvement on an antiberiberic diet combined with hematinics and cardiac stimulation. The last is of no small importance as it is a clinical observation that the danger of acute failure of the heart is especially great in beriberi and this constitutes a common termination of the disease.

Beriberi has come to be considered one of a group of food deficiency diseases, such as pellagra, rickets, scurvy, infantile and other forms of malnutrition. Hence it is evident that beriberi can arise under the greatest variety of conditions, and in fact it is reported from far northern countries as well as from the tropics. There is no inherent reason why it should not develop in California. Milled rice is not at all the only dietary which because of a lack of vitamins may eventuate in beriberi. In fact Draper (*Journal of Tropical Medicine and Hygiene*, April 15, 1916) has recently reported nine early cases out of a crew of fourteen men on a Norwegian bark touching at St. Helena. Several of these cases were so mild as to have passed unnoted perhaps except for the occurrence of two or three more severe cases. Here the victims had eaten very sparingly of rice and had an abundance of fresh vegetables. Thus it is seen that it is not always possible to demonstrate an evidently beriberic diet. In fact it is such instances which lend color to the parasitic theory of etiology of beriberi which is held especially by certain English writers. Thus in his annual report for the health department of Shanghai in 1914, Stanley, who is one of the most competent sanitarians in the Far East, says: "The cause of this disease (beriberi) remains under close observation, though up to the present wrapped in obscurity. The evidence preponderates in favor of the disease being an infective one having no direct relation to food but infective through body vermin." This view does not seem tenable in relation to the American and Dutch results in the East Indies and the Philippines but is mentioned to show the fact that the exact dietary causes can not always be exactly determined.

An interesting point has been noted frequently in connection with emetin to the effect that one prominent symptom of emetin poisoning seemed

to be a condition not to be distinguished clinically from acute beriberi. This observation has been made repeatedly. Also it has been observed that a beriberic condition was a not infrequent complication of bacillary dysentery as well as of amoebic dysentery. This raises a question which apparently is fully answered by J. Preston Maxwell from South China (*China Medical Journal*, July, 1915). Maxwell treated one of his own students for an intestinal amœbiasis with a course of emetin injections and during the course of the treatment the patient developed a well-marked peripheral neuritis which only gradually cleared up. After a considerable period, the same student suffered a second amoebic infection and again received a course of emetin, the dose and preparation used being identical with those of the former attack. But this time Maxwell put the patient on a rice-free anti-beriberic diet and no neuritis developed. It seems clear that emetin or dysentery may thus act as an exciting cause of acute beriberi in a person already subject to the proper vitamin deficiency.

According to Casimir Funk who named the group, there are probably several vitamins or rather a group of them, differing according to their various sources. It has become a practical problem to find an adequate source of vitamins so that a comparatively large dose may be administered in concentrated form. To this end Seidell (Public Health Reports, February 18, 1916), has reported such an extract prepared from brewer's yeast. Seidell's method was as follows: "To a large volume of clear autolyzed yeast filtrate is added fifty grams per litre of the colloidal hydrous aluminium silicate reagent as prepared by Professor Lloyd of Cincinnati for alkaloidal separations. The mixture is well shaken and allowed to stand for several hours, until the supernatant liquid is practically free from suspended solid." The liquid is siphoned off and the solid is again filtered, washed and evaporated to dryness. Seidell found that this material was fully efficient as a cure and as a preventive agent in the neuritis of pigeons induced by a polished rice diet. On the basis of doses found necessary in pigeons, the dose for an average man of sixty kilos would be about five grams per day, which is well within convenient limits of administration. Seidell points out that while there is every reason to believe that this concentrated preparation of yeast vitamin would have a preventive and curative effect in beriberi, it might not prove to be the particular vitamin adapted to the needs of pellagra or other deficiency disease. He says further, however, that the method of preparation is applicable to other raw products and he has already applied it to the potato.

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### THE PREVENTION OF QUARANTINABLE DISEASES ON THE BORDER AND AT PORTS OF EMBARKATION.\*

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It was the original intention that another officer of the Public Health Service should prepare the paper for to-day, but, unfortunately for the pleasure of you gentlemen, since the arrangement was made, that officer has been ordered to El Paso. The title of this article had been selected and was sent to me by him. On looking at the title three things occurred to me, *1st*, that it might be of more interest to you if the talk was not limited to the strictly quarantinable diseases but was a little more comprehensive in character; *2nd*, the word "Border" seemed to be used as if there were but *one* border to the United States, whereas in preventing the entrance of quarantinable diseases there are four borders which must all be guarded; *3rd*, the name of this society—the "Medical Preparedness League." Certain words frequently assume a particular meaning in our minds, a meaning perhaps not literally correct but dependent upon the custom and association of the moment. Words at times have a certain vogue, as do many other things, and I suppose at present the word "preparedness" instantly brings to most of our minds something connected with *war*—it did to mine in this instance, and of a war in which many of our profession have gone to their death.

Records of medical warfare against disease are as old as any historical facts which are presented to us. From the time when the 13th and 14th chapters of Leviticus described the laws to be enforced against lepers down through the period when persons afflicted with certain contagious diseases were pushed out of the community in which they lived to shift for themselves as best they could; from the barbarous peoples in various lands who have made it a custom to destroy at birth physically unfit babies; to the present time when more humane efforts are employed, man has been continuously at war against those disease agencies which he has learned, as his education progressed, are a danger to himself and to his family. Military warfare is intermittent. Exhaustion, defeat, and change of viewpoint occasion its temporary cessation, but our medical enemies neither recognize exhaustion nor acknowledge defeat. If our defensive measures are relaxed for a moment they attack again and more insidiously and more invisibly than military enemies. They never pursue the enlightened policy of a declaration of war, and, before we know it they have out-generated us, passed our outposts, found a weak point in our main line of defense and appear well organized and ready for extensive action in our very midst. The fact that we are always confronted with a relentless enemy who is ever ready to take advantage of a weak spot, and having gotten the advantage is heartless in the extent of his depredations, has brought most of the enlightened nations to realize that to repel these

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assaults certain defenses must be erected and the sentries on duty must keep constantly on the "qui vive" to detect the first sign of attack. The efforts of our own government to defend the United States against disease may be said to have started with the inauguration, in 1798, of the Marine Hospital Service, the prototype of which is the Marine Hospital at Greenwich, England. While it is true that the foundation idea in the inauguration of the Marine Hospital Service was to further the cause of the infantile American Merchant Marine by extending medical aid and hospital treatment to sick sailors, at the same time the medical officers of these hospitals soon began to assume certain other functions necessitated by the growth of the country and the extension of federalization in the execution of its laws. The ultimate result of this is that at the present time the country is protected from foreign disease invasion by two systems of defense, one by its quarantine stations, and the other by its immigration stations. It is a very common error among those not entirely familiar with the subject to assume that the medical examinations performed at Immigration stations are part and parcel of the Quarantine Service. This idea is entirely erroneous, as the medical examination of arriving immigrants is necessitated by the provisions of the Immigration Law, which has no connection whatsoever with the Maritime Quarantine Laws of the country. The quarantinable diseases are six in number and of a very different type than, if I may coin an expression, we will speak of as the "immigration diseases." They are, speaking as a group, more severe, more startling, and, with one exception, of an epidemic tendency; while the "immigration diseases" are vastly more varied both in character, seriousness, and results. The quarantinable diseases are Smallpox, Yellow Fever, Cholera, Plague, Typhus Fever, and Leprosy, while the "immigration diseases" are placed in various groups by the Immigration Law of 1913.

The outmost vedettes in our system of defense are our consuls stationed in various parts of the world. These officials, in compliance with the quarantine law, issue bills of health to every vessel leaving their port for a United States port, and supplemental bills of health if their port chances to be a port of call of the vessel en route to this country after leaving its original port. They also supply to the Surgeon-General of the Public Health Service advanced information as to the activities of any of our medical enemies, provided epidemic disease of any form manifests itself within their jurisdiction, and they keep him informed as to the extent and progress of any such diseases.

Our outposts are such officers of the Public Health Service as are stationed in foreign ports and who are usually attached to our consulates at those ports. At present officers are stationed at Naples, Guayaquil, Hongkong, Amoy, Callao, Frötera, Guantanamo, Havana, Halifax, La Guaira, Lethbridge, Messina, Montreal, Progreso, Quebec, St. Johns, New Brunswick, Salina Cruz, Shanghai, Tampico, Tuxpam, Vera Cruz, Vancouver, Vic-

toria, Winnipeg, and Yarmouth, besides those in the Philippine Islands, Porto Rico, Hawaii, and the Canal Zone. These officers keep the Surgeon-General in closer touch with medical matters occurring in their vicinity, give advice as to cargo and passengers, in some cases superintend disinfection of cargo manifested to the United States, examine embarking aliens, issue bills of health and cargo manifests, observe whether or not the vessel while in port conforms to port regulations governing the spread of disease, and, supposedly, allow nothing of a medical nature to escape their notice. The reports received by the Surgeon-General from these vedettes and outposts are immediately published in the Public Health Reports issued weekly and sent to every officer of the Public Health Service, no matter where stationed, to presidents, secretaries, and members of state boards of health, and to all other persons who are sufficiently interested in Public Health matters to request that their name be placed upon the mailing list. In this way, supplemented by telegraphic information sent from headquarters when necessary, to the particular section of our line of defense that may expect attack, are the officers on duty in this war kept en rapport with the strategy of our medical enemies. Our main defenses consist of the quarantine and immigration stations so located as to form a practically unbroken line stretched around the entire border of the continental United States.

It would be tiresome to mention by name each place where examinations of arrivals take place, but to summarize quickly, in order to give you a fairly definite idea of the extent of the defense, there are on the Atlantic and Gulf Coast 38 quarantine stations and 9 immigration stations—on the Pacific Coast 13 quarantine and 4 immigration stations, while stretching across the northern boundary from Halifax to Vancouver are 25 immigration stations, 17 of them on United States territory and 8 on Canadian soil. These latter are maintained under an agreement between the United States Department of Labor, under whose jurisdiction the Immigration Service is, and the Canadian transportation companies and are so situated for the mutual convenience of the parties mentioned and the aliens, in order that if it so happens that an alien must be deported he will have been saved the time and inconvenience of going from the seaport at which he arrived to the border, and the transportation company will save the haul. Across the southern boundary, including the Gulf, are 16 immigration stations.

It must not be understood that of this extensive number of stations, all are large, fully equipped plants, because at such places as receive only an occasional vessel there may be no quarantine plant whatever, but an officer of the Public Health Service, almost always an Acting Assistant Surgeon, is located there and with power, if necessary, to remand the vessel to the nearest fully equipped quarantine station, and likewise at many of the small ports of entry for immigrants—places where perhaps but few people are received during the year there may be but one immigration inspector and one Acting Assistant Surgeon—very

different indeed from the large well equipped immigrant hospitals such as Ellis Island and San Francisco, but still a link in our line of defense.

The Immigration Law enumerates certain types of medical enemies with which, for the protection of our people both from a medical and economic standpoint, it will specially deal and the regulations group these diseases into certain classes, not always absolute, but sufficiently definite to form a practical working basis. To illustrate, the law says that loathsome diseases shall be excluded. I know of no strictly medical classification or enumeration of loathsome diseases. Whether or not a disease is loathsome depends entirely upon the personal attitude of the observer, and that attitude may be largely influenced by his familiarity and association with the particular disease under observation—for instance, personally I consider an old, extensive scabies, scratch marked, probably infected and generally neglected, as loathsome in the extreme, but at the same time it is not within the meaning of the government's classification of loathsome disease as regards deportation of the person affected.

Section 2 of the Act approved February 20, 1907, provided "That the following classes of aliens shall be excluded from admission into the United States: All idiots, imbeciles, feeble-minded persons, epileptics, insane persons and persons who have been insane within five years previous; persons who have had two or more attacks of insanity at any time previously; persons afflicted with tuberculosis or with a loathsome or dangerous contagious disease; persons not comprehended within any of the foregoing excluded classes who are found to be and are certified by the examining surgeon as being mentally or physically defective, such mental or physical defect being of a nature which may affect the ability of such alien to earn a living." And Section 9 of the same law levies a fine of \$100 against a transportation company for each and every case brought to our country except those falling within the last classifications mentioned, namely, with some disease liable to affect their ability to earn a living.

For the sake of simplicity and to promote efficiency in handling the arriving aliens, these diseases are grouped into Class A I, Class A II, Class B and Class C, and certain diseases of each class are enumerated as types to serve as a guide in decisions regarding diseases of a similar or allied nature. These classes with their types are: Class A I—Idiots, imbeciles, feeble-minded persons, epileptics and insane persons; Class A II—Loathsome contagious disease—Favus, ringworm of scalp, sycosis barbe, actinomycosis, blastomycosis, frambesia (yaws), mycetozia (Madura foot), leprosy, demonstrable syphilis in the active communicable stage, gonorrhea and soft chancre. Dangerous contagious disease—Tuberculosis, trachoma, filariasis, uncinariasis, amoebia infection, endemic haematuria (Bilharzia disease). The diseases in these two classes are mandatorily deportable under the law except at the discretion of the Secretary of Labor. The Immigration Law like all others, reads "at the discretion of the Secretary" and it

sometimes, though comparatively infrequently, happens that there are very unusual circumstances surrounding a particular case due to which the alien is allowed to land for hospital treatment until cured. It might be inexact to say that these few cases present extenuating circumstances because as it is usually not one's own fault that he is ill or crippled there is nothing to extenuate, but rather there are sometimes humanitarian reasons which influence the decision to allow treatment—such, for instance, as all the members of a family being in this country except one child or perhaps an aged parent; or an alien presenting a disease which is very readily curable in a comparatively few days, as uncinariasis, and which is obviously not the type of dangerous contagious disease that the framers of the law had in mind but which nevertheless it seems necessary to include in this class. Class B—All diseases and physical disabilities that in the opinion of the medical officer will materially impair a person's capacity for self-maintenance. It is this class of diseases which led me earlier in this paper to speak of medical defense against economic enemies. This class is not dangerous from either the standpoint of contagion or heredity, but it may be very greatly so from the standpoint of municipal expense. It includes all defective and diseased conditions tending to call for institutional care or treatment, all conditions that are likely to need medical treatment for a more or less protracted period, all deformed or crippled children who will require unusual care during childhood or who are likely to become physically defective if they live to reach maturity, chronic or semi-chronic conditions of a serious nature, all of which, it is apparent, cannot be specifically mentioned but of which the following are types: hernia, heart disease, states of permanently defective nutrition and of marked defective skeletal or muscular development, arthritis and myositis, nervous affections, malignant new growths, Bright's disease, senility, varicose veins, serious defects of vision occasioned by other than refractive errors and certain cutaneous affections.

The diseases of this class cover, as you will readily see, almost the entire range of medicine and they are not, as are the Class A diseases, mandatorily deportable under the law. Each particular case certified by the medical officers is investigated upon its own merits, by a board of Immigration Inspectors who take into consideration all matters affecting the alien and determine whether or not his social or financial status, his particular occupation, his friends or family connections, etc., have a sufficient bearing on the individual case to render the chances of his becoming a public charge on the community in which he lives probable or remote. Two certificates might be worded identically alike by the medical officers—let us say "mitral regurgitation—affecting ability to earn a living." Upon investigation by the immigrant inspectors it might be found that one was rendered against a bookkeeper of good habits who had several brothers already in this country and who already had saved a few

hundred dollars; the other was rendered against a laborer—a man who could earn his living only by the most arduous physical work, who had come out alone with scarcely a dollar above his passage money and who had no friends or relatives here. Clearly, while both had exactly the same condition, the one would have a tremendous advantage over the other both as to probable length of life and ability to be self-supporting, and the one might fairly be given permission to land while the other would be deported.

Class C includes defective or diseased conditions which do not present, in the opinion of the medical officer, the requirements for certification under Class A or B. They are minor and unimportant affairs but are noted because it is desirable, for various reasons, to keep a record of them, and because the law says that the Public Health Officers shall bring to the attention of the Commissioner of Immigration "any and all" medical conditions noted by them.

How are these various conditions discovered and what defense, in the application of the Immigration Law, does San Francisco offer to the entrance of our disease enemies? I select San Francisco simply because it is more familiar, and therefore may be more interesting, to this particular gathering.

On the arrival of a ship from a foreign port (with the exception of Vancouver and Victoria, where the passengers are inspected by our own officers before embarkation), but let us because of the added interest say from an Oriental port, for that is where our disease enemies are usually massed in greatest numbers, a Public Health officer attached to the Medical Division of the Immigration Service at Angel Island boards the vessel as soon as she has been given pratique by the Quarantine Officer,—of whose work we shall speak later—and first consults with the ship's surgeon as to what sickness has occurred during the voyage, and examines his official sick-report, which report is made under oath. If this report shows the presence of any certifiable immigration disease occurring in any other than an American citizen, he requests, if in his opinion the condition warrants it, that the alien be taken to Angel Island either for further observation or hospital treatment. He then makes a careful visual inspection of all 1st cabin passengers—observing their color—gait—activity—mental state, evidence of oedema, and, in short, looks for any condition which would lead to a supposition that some bodily ill may be present. This inspection is generally made without the knowledge of the passenger, by circulating among them and scrutinizing each one. If leading symptoms are discovered the passenger is quietly talked to individually and perhaps a further examination made in his cabin. At any rate, the medical officer either comes to his conclusion on board, in which case he reports his findings to the Immigration Inspectors so that, if possible, the passenger will not be unnecessarily inconvenienced, or, failing this, requests that he be brought to Angel Island. This ends the 1st cabin inspection.

All of the 2nd class and steerage who are not American citizens, are brought to Angel Island and grouped in the different examining wards, according to sex. Every eyelid is turned in a search for trachoma, and in the case of the men each is stripped completely and carefully examined from the top of his head to the soles of his feet, including a rather unique little test of jumping a nine inch hurdle, in the effort to detect beriberi, of which disease, parenthetically, we have had some 32 cases in the last three years. With the women the lids are all turned and a very careful scrutiny made, including pulse and temperature, for anything suspicious, but they are not undressed unless some condition necessitating further examination is found, in which case they are prepared by the nurse for a regular physical. A specimen of feces is obtained from each alien, both men and women, prepared and sent to the laboratory, and a microscopical search made for the ova of uncinaria.

Naturally we endeavor to make our defense against particular forms of attack strongest at those places where experience has taught us that that particular attack is most likely to occur, and that is why, for instance, that here we examine microscopically every 2nd class and steerage oriental for hookworm disease, because, knowing the extremely large percentage of infection existing in China and Japan, and also having learned that it is quite impossible to diagnose hookworm disease in orientals by their appearance, we must employ more stringent measures against this particular disease than they do, say, at Ellis Island, where the aliens arriving are not generally from heavily infected areas and are of a type in which leading symptoms of the disease can more readily be discerned. On the other hand, at Ellis Island, due to their experience with the number of mental defectives applying for admission their examination along this line is more searching than at San Francisco where it is the rarest kind of thing to find a feeble-minded, imbecilic, or insane oriental presenting himself for admission.

What, to summarize quickly, was the total result of the immigration defense measures along the line described at this port during the fiscal year 1915? 16,959 aliens were examined. Of this number 7,316 were brought from the ship to Angel Island for more extended examination, and of this latter number 1,080 were certified to the Commissioner of Immigration as presenting some mental or physical condition falling under the provisions of the Immigration Law. These certificates represented 128 different diseases or defects and ran the entire gamut from pterygium to epidemic cerebro-spinal meningitis. Some conditions were represented only once, as for instance chronic rheumatoid arthritis, and some, as uncinariasis, many times, there being 486 cases of this disease.

What was the sum total defense, as represented by the number of people actually debarred from entering the United States, provided by the entire immigration medical inspection at all stations in the country during the fiscal year 1915? and I

would remind you that during that year not one quarter the number of aliens applied for admission as did in 1914 or 1913. To be exact, in 1915 there were 326,700 applicants, in 1914 there were 1,218,480, and in 1913, 1,197,892. In fact, we must go back seventeen years to 1899, in which year there were 311,715, to find as small a number as applied in 1915.

During 1915 the actual debarments were idiots, imbeciles, feeble minded, epileptics or insane, 483; mental defects other than mentioned, 29; loathsome or dangerous contagious disease, 1613; physical defects affecting ability to earn a living, 926,—a grand total of 3,051 persons,—corresponding roughly to the number in a solid brigade of troops on a peace footing, and in the year previous, which we may call a normal year, there were 19,700 excluded for the causes mentioned, practically a full division,—the command of a Major General,—perhaps in this case General Undesirables.

We can, as we have, estimate the number of afflicted persons actually debarred, but who of us can possibly estimate the total devastation these disease enemies would have occasioned if they had penetrated both the outer weak defenses at ports of embarkation and the main line defenses of the border, north, east, south and west? Who can possibly estimate the number of feeble-minded progeny of these feeble-minded persons had they been admitted, who can estimate the eleemosynary expense of the descendants of these debarred epileptics, who can count the number of ultimately blind who would have contracted their original trachoma from some of those sent back,—who knows the number of future American children spared the horrors of inherited syphilis, or who cares to venture a guess as to the number of pustules, ophthalmias, tubercular conditions and deformities which might have been. but will not be, because of the detection of—not strictly speaking "quarantinable"—but "immigration diseases" on the border?

The first paragraph in the "Quarantine Regulations," issued by the Surgeon General of the United States Public Health Service, is "For the purpose of these regulations the quarantinable diseases are cholera, yellow fever, small-pox, typhus fever, leprosy and plague," and it will be appreciated that, with this limited number of quarantinable enemies to deal with and our (in the main) definite knowledge as to their individual mode of attack, specific defense measures have been worked out against each disease and an outline of these measures will be briefly given.

Now our medical vedettes get into action because of the directions contained in par. 2 of the regulations which states that "Masters of vessels clearing from any foreign port, or from any port in the possessions of other dependencies of the United States for a port in the United States or its possessions of other dependencies, must obtain an original bill of health, in duplicate, signed by the proper officer or officers of the United States, as provided for by law \* \* \*." These bills of health are issued by our consuls, except in those

places where an officer of the Public Health Service is stationed, when they are issued by him. A bill of health contains a great amount of information and states among other things the name, nationality, rig, master, tonnage, and compartments of the vessel, the name of the medical officer if the vessel carries one, the number of officers, crew and passengers, the previous ports of call if any, the number of cases of sickness and the character of same during the last voyage, the number while the vessel was in port, the kind of trade the vessel is engaged in, the nature, sanitary history and condition of her cargo, the source and wholesomeness of the water and food supply, the sanitary history and health of the officers, crew and passengers with the sanitary history and condition of their effects, the location of the vessel while in port—as the wharf, open bay, or distance from shore, the time the vessel was in port and the character of communication with the shore, the sanitary condition of the port itself and its vicinity, the prevailing diseases at the port and the number of cases and deaths from the quarantinable diseases during the two weeks preceding the issuance of the bill of health.

It will be seen that, while these questions seem numerous enough, almost every one may have some very direct bearing upon one or more of the quarantinable diseases—for instance the wholesomeness of the food and water supply and the character of the cargo have a direct relationship with possible cholera, the location of the vessel while in port—whether or not directly alongside the wharf or fended off and with rat guards on all her lines has a direct bearing on plague, and the character of communication with the shore might help us in coming to a decision in regard to yellow fever or typhus.

Having started with this original bill of health the next defensive measure is a supplemental bill of health at each port of call, and in this connection the last portion of par. 3 of the regulations is as follows, "If a quarantinable disease has appeared on board the vessel after leaving the original port of departure, or other circumstances presumably render the vessel infected, the supplemental bill of health should be withheld until such measures have been taken as are necessary."

The regulations contain certain specific instructions to inspecting officers which, as they illuminate the value to be placed on their work I will quote.

1st. The officer issuing the bill of health shall satisfy himself, by inspection if necessary, that conditions certified to therein are true, and is authorized, in accordance with the law, to withhold the bill of health, or the supplemental bill of health, until he is satisfied that the vessel, the passengers, the crew, and the cargo have complied with all the quarantine laws and regulations of the United States."

2nd. "Inspection is required of

(a) All vessels from ports at which cholera, yellow fever, or plague in men or rodents prevail, or at which small-pox or typhus prevails in epi-

demic form, and at which a medical officer is detailed.

(b) All vessels carrying steerage passengers; but need only include the inspection of such passengers and their living apartments if sailing from a healthful port."

3rd. "Inspection of a vessel is such an examination of vessel, cargo, passengers, crew, personal effects of same, including examination of manifests and other papers, food and water supply, the ascertainment of its relations with the shore, the manner of loading and probabilities of invasion by rats and insects as will enable the inspecting officer to determine if these regulations have been complied with."

4th. "When an inspection is required it should be made by daylight as late as practicable before sailing. The vessel should be inspected before the passengers go aboard, the passengers just before embarkation, and the crew on deck, and no communication should be had with the vessel after such inspection, except by permission of the officer issuing the bill of health."

The regulations also provide that a vessel shall be mechanically clean, that all portions of the vessel which may have been infected by any communicable disease shall have been disinfected, that the air space, ventilation, food and water supply and hospital accommodations shall conform to the provisions of a certain Act of Congress, that street sweepings, city cleanings, or anything containing organic matter shall not be taken as ballast from any port, that bedding, soiled wearing apparel, upholstered furniture, rags and articles of similar nature coming from a district known to be infected with cholera, small-pox or typhus, shall be disinfected prior to shipment, that any article shipped from, or through, an infected place and which the examining officer has reason to believe infected shall be disinfected, that no person suffering from a quarantinable disease or from scarlet fever, measles, diphtheria, or *other communicable disease*, should be allowed to ship. In addition to all of the foregoing every steerage passenger is furnished with an inspection card conveying detailed personal information, is supposed to be inspected every day by the ship's surgeon who punches an appropriate place on the card at each inspection, and must be vaccinated during the first portion of the voyage—unless they show satisfactory evidence of having acquired immunity to small-pox by previous attack or successful vaccination within one year.

The measures outlined represent the ordinary defense measures of our outposts where no particular form of attack is anticipated—or, in other words, at uninfected ports—but there are special orders to execute in case of known danger from particular enemies. At ports where cholera prevails the orders are that special care should be taken in regard to water, food, and textile fabrics. The drinking water unless of known purity should be boiled and the food thoroughly cooked and protected against flies. The latrines of vessel must be so arranged that they, including their discharge pipes, can be kept mechanically clean, and unless un-

avoidable, vessels should not take water ballast from a source contaminated or suspected of contamination by cholera. When unavoidable, the facts must be noted on the bill of health. Unsalted meats, sausages, dressed poultry, fresh butter or cheese should not be shipped and the inspector must be satisfied that fresh fruits or vegetables cannot possibly have become contaminated. Textile fabrics (with certain exceptions) must be accompanied by a certificate of disinfection in accordance with specific regulations, and steerage passengers and crew from infected districts must be detained five days before embarkation, in suitable quarters located where there is no danger from infection.

#### SPECIAL ORDERS IN CASE THE ENEMY IS YELLOW FEVER.

Precaution should be taken to prevent the introduction of mosquitos (*stegomya*) on board the vessel. Water tanks, water buckets and other collections of water should be capped, screened or guarded in such a manner that they will not become breeding places, and mosquitoes should be destroyed if present aboard the vessel. With the exception of those immune to the disease no passenger or member of the crew who has been definitely exposed to infection of yellow fever should be allowed to embark for six days after such exposure.

#### SPECIAL ORDERS AGAINST ATTACKS BY PLAGUE.

At ports where either human or rodent plague prevails every precaution should be taken to prevent rats, fleas, or other vermin from getting aboard the vessel. The vessel should not lie directly against the dock, or any other place from which rats can get aboard, but should be fended off and all lines running ashore should be freshly tarred and provided with efficient rat-guards, and especial care should be exercised against rat infected lighters being placed alongside the ship. If the vessel docks all parts should be simultaneously fumigated to kill rats and vermin before sailing, and this procedure should be applied to a vessel arriving at a foreign port in transit to the United States, provided she has been at a plague infected port where the before mentioned conditions have not been fulfilled. Articles which are liable to harbor rats or rat fleas should not be shipped until they have been freed from such vermin by fumigation or have been kept in a rat proof place for 15 days prior to shipment. The nature of the merchandise and the place and method of stowing prior to shipment must be considered in determining its liability to be a rat or vermin carrier, thus, layers of hides, bags of grain, etc., so stowed as to be used as nesting place for rats, would be flea, and might be rat, carriers. Passengers and crew, if they have come from a house or locality known to be infected should not be allowed to embark for seven days after said exposure unless they are already immune by previous attack, or have taken prophylactic serum.

#### SPECIAL ORDERS IN CASE THE ENEMY IS SMALL-POX.

All steerage passengers and crew coming from

districts where small-pox is epidemic, should be vaccinated *before embarkation*, unless immune, or vaccinated within a year, and their baggage disinfected if necessary.

#### SPECIAL ORDERS IF THE ENEMY IS TYPHUS FEVER.

Steerage passengers and crew who have been exposed to the infection of typhus fever should not be allowed to embark for a period of at least twelve days after such exposure and until their baggage has been disinfected and the destruction of vermin assured.

#### SPECIAL ORDERS AGAINST LEPROSY ATTACK.

No alien who is a leper should be allowed to embark for the United States under any condition.

With the execution of the orders cited *vedettes* and outposts have furnished all of the defense which we may rely upon them for, but if, unfortunately, the enemy has managed to bewilder or deceive them, the line of approach to our main defenses, the quarantine stations, is still harassed by the opposition of persons who, while not actually enlisted upon either side, are still most heartily antagonistic to an enemy victory. These persons are represented by the Masters and Surgeons of vessels at sea and, in order that their opposition may be as effective as possible, they are furnished with instructions as to how to most effectually hamper the enemy—these instructions comprise information as to how to disinfect water-closets, fore-castle, bilges and similar portions of the vessel; to maintain free ventilation and rigorous cleanliness during voyage, and measures to destroy rats, fleas, flies and mosquitoes; isolation of any one sick with a communicable disease, and the detail, if possible, of some one immune to the disease to care for him; reduction of communication with patient to an absolute minimum; disinfection of clothing, body linen and bedding of patients and nurse; disinfection of compartment occupied and its contents; the use of mosquito bars and destruction of mosquitoes and “wiggle tails” if the case be yellow fever or malaria; special measures to destroy rats and vermin if the case be plague; to destroy vermin if it be typhus; and to boil water, thoroughly cook food, and to immediately disinfect and throw overboard the discharges if the case be cholera, typhoid fever or dysentery; formulæ for disinfecting solutions of bichloride, carbolic and formalin, are provided and instructions given as to their use as well as the use of sulphur and pyrethrum powder.

With the arrival of the vessel at a United States port the enemy, if not checked by the obstacles already thrown in his way, becomes opposed to our main defense. Every ship from a foreign place (or any vessel with sickness on board) is, upon entering port, required by law to break out the yellow flag at the fore-peak. This signifies that she has not as yet passed quarantine and the law prohibits anybody except the quarantine officials to board the vessel as long as the flag flies, which it must do until the master is given *pratique* by the quarantine officer, which is done immediately upon completion of the inspection provided nothing of a suspicious nature is

discovered and the vessel has complied with laws and regulations relating to the subject in hand. The quarantine officer on boarding the ship inspects the bill of health and clinical record of all cases treated during the voyage, the crew and passenger lists and manifests and, if necessary, the ship's log may be examined. The crew and passengers are mustered and examined and compared with the lists and manifests and any discrepancies investigated. The clinical thermometer is used in examining the personnel of vessels under suspicion. The freight manifest is examined to ascertain if articles requiring disinfection have had it and if the required certificate accompany them. To promote the accuracy of his work the quarantine officer when in the performance of his duty is authorized to take declarations and administer oaths in matters pertaining to the quarantine laws and regulations. If this inspection demonstrates that there is no quarantinable disease on board and no cargo of an infected nature, the master is given a statement that his vessel is granted *pratique*, the yellow flag is hauled down, and the vessel proceeds on her way, but on the other hand, if disease is discovered, what are the especial defense measures employed to check each specific enemy?

Before describing these, and to illustrate that we are not inclined to trust absolutely to the perfection of our defense, and prefer to prepare for emergencies, I will quote par. 67 and 68 of the regulations, which are as follows:

Par. 67. “After arrival at a quarantine station of a vessel carrying immigrants and upon which there has appeared during the last voyage a case of cholera, small-pox, typhus fever, or plague, and after quarantine measures provided by regulations of the Treasury Department have been enforced and the vessel given free *pratique*, it is hereby ordered that notification of the above-mentioned facts be transmitted by the quarantine officer to the commissioner of immigration at the port of arrival, who shall be requested to transmit, by mail or telegraph, to the State health authorities of the several states to which immigrants from said vessels are destined, the date of departure, route, number of immigrants, and the point of destination in the respective states of the immigrants from said vessel, together with the statement that said immigrants are from a vessel which has been subject to quarantine by reason of infectious disease, naming the disease. This information is furnished to state health officers for the purpose of enabling them to maintain such surveillance over the arriving immigrants as they may deem necessary.”

Par. 68. “When a vessel arriving at quarantine has on board any of the communicable but non-quarantinable diseases, the quarantine officer shall promptly inform the local health authorities of the existence of such disease aboard and shall make every effort to furnish such notification in ample time, if possible, to permit of the case being seen by the local authorities before discharge from the vessel.”

Suppose now, that the quarantine officer finds that our enemies have launched one particular

kind of attack against us, what is the specific defense for each of the particular forms in which it may occur? Added to the general measures against a vessel presenting a quarantinable disease, such as prohibiting communication with any place or person outside; dumping any form of ballast which contains organic refuse; removing the crew and disinfecting the vessel proper; daily night and morning inspection of detained persons; discharging no person from quarantine until the period of incubation has expired, etc., the specific defenses are as follows:

#### IN THE CASE OF CHOLERA.

Five days are considered the period of incubation; if the vessel carry persons from cholera infected ports a bacterial examination should be made of any cases of diarrhoea before granting pratique. (At the present moment, because of the rather extensive presence of cholera in Japan and China every steerage passenger arriving in San Francisco from the Orient is subjected to an examination of the feces, before release, to determine whether or not he is a cholera-carrier); if cholera has appeared on board, remove all passengers and all crew, save those necessary to care for her, and place the sick in hospital. Isolate suspects and segregate remainder in small groups; those believed to be especially capable of conveying infection must not enter the place of detention until bathed and furnished with non-infected clothing; water and food supply must be strictly guarded, to prevent contamination, and issued to each group separately; no fruit or uncooked vegetable permitted; prevent spread of infection through flies or other insect; disinfect dejecta of all persons in quarantine; discharge water supply of vessel, disinfect her water casks or tanks, thoroughly rinse and refill with boiled water; disinfect all baggage, all articles of cargo and all compartments that may have been exposed to infection; vessels arriving with water ballast presumably infected must return to sea under guard and discharge such ballast.

#### IN THE CASE OF YELLOW FEVER.

Six days shall be considered the period of incubation. Disembark sick, protected by mosquito netting, and transfer to place of isolation; disembark others and subject to observation for six days—those presenting a temperature of 37.6 being isolated in a screened apartment; moor ship at least 600 feet from inhabited shore; fumigate ship, if possible, before discharge of cargo, to destroy mosquitoes which shall be done by a complete and simultaneous fumigation of all parts of the vessel by sulphur dioxide gas 2% volume, two hours exposure. If sulphur is liable to injure cargo use pyrethrum powder or campho-phenol. If cargo must be discharged use immune persons for the work, or if non-immunes are employed place them under observation for six days from date of last possible exposure.

#### IN THE CASE OF PLAGUE.

Seven days shall be considered as the period of incubation. Disembark and isolate the sick; pre-

vent rats getting ashore and on board as soon as possible—the cargo being partially or completely removed if necessary to render this process efficient; hold all persons under observation not less than five days, and seven if in the least suspicious; disinfect and render free from vermin all soiled linen, personal effects in use and belongings of passengers and crew; be absolutely sure that vessel is free from rats and vermin; destroy rats on all vessels engaged in trade with ports infected with plague at least every six months—using simultaneous fumigation with  $\text{SO}_2$ , 2% and six hours exposure if vessel is empty, and  $\text{SO}_2$ , 4% and twelve hours exposure if cargo is in place. (Since the issuance of the regulation quoted cyanide gas is being used for this purpose.)

#### IN THE CASE OF SMALLPOX.

Fourteen days shall be considered the period of incubation. Any personnel who have been actually exposed during the voyage must be vaccinated or detained in quarantine not less than 14 days for observation; if the sick have been properly isolated from the start of the disease, the vessel need not be quarantined further than the removal of the sick, the disinfection of all compartments, baggage and articles that have been exposed to infection; if proper precautions have not been taken, all who have been exposed will be detained unless they have had smallpox or been properly vaccinated within the year.

#### IN THE CASE OF LEPROSY.

No vessel arriving with leprosy on board will be granted pratique until the leper and his baggage have been removed to the quarantine station. No alien leper shall be landed in the United States, and shall be deported to the country whence he came at the expense of the steamship company or vessel which brought him here.

#### IN THE CASE OF TYPHUS FEVER.

Twelve days shall be considered the incubation period of this disease. Vessels in good sanitary condition, but having typhus fever on board which has been properly isolated, need not be quarantined further than the removal of the sick, the disinfection of compartments and their contents exposed to infection, and the destruction of vermin. If the case has not been isolated, or the disease has spread on board from person to person, the vessel will be quarantined, the sick removed and isolated, and those who have been exposed to infection detained under observation. Vessels in bad sanitary condition on which the disease has appeared will be thoroughly cleaned and disinfected, as will also all baggage that has been exposed to infection, in such a manner as to insure the destruction of vermin.

In view of the present conditions in Mexico, the amount of typhus fever prevailing there, and the desire of numerous Mexicans to enter the United States via our southern boundary, it seems that at the present minute the subject of the prevention of the spread of this disease is of nearer interest to us than that of any other of the quarantinable diseases. In this connection it will interest you to know that during the last eighteen months the

United States Public Health Service has established plants on the Texas border where baggage and effects may be disinfected and persons bathed to free them from body lice. Senior Surgeon C. C. Pierce, of the Public Health Service, who is now in charge of this work, says, among some rules recently published: "If a person infested with lice develops typhus fever he should be thoroughly disinfected, by having his hair clipped short and the body bathed with hot water and soap. All clothes should be boiled or destroyed by burning, care being taken that no lice that might be on the clothes escape." And "In order to rid a person's head of lice the hair should be soaked with a mixture of equal parts of kerosene oil and vinegar, covering the head with a towel for about one-half hour. The vinegar loosens the nits and the kerosene oil kills the adult lice. After one-half hour the head should be thoroughly washed with soap and water. Where the hair is very thick and where there are many lice more than one application of this remedy is necessary," and "in cases of children or men infested with head lice it is best to clip the hair and then wash the scalp with soap and water. This will be sufficient. The hair removed should be collected on a newspaper, rolled up and burned." Grubbs, in the Public Health Reports of October 20, 1916, recommends a rather more extensive method than this and uses a gasoline-soap spray and shower bath for the body and vacuum-cyanide process for the clothing and baggage, and in the British Medical Journal of June 19, 1915, may be found a short but comprehensive report entitled "An investigation of the best methods of destroying lice," by Kinloch.

At the present time we believe that the only agency for the transmission of typhus fever is the louse—particularly *pediculi vestimenti* and possibly *pediculi capitis*. Body lice, or as sailors and soldiers call them, "seam-squirrels," live most of the time, and lay their eggs, on the clothes, but feed on the wearer. Their existence is comparatively short if deprived of food and warmth, and it takes their eggs about eight days to hatch out; therefore clothing frequently changed, and thoroughly laundered by boiling and ironing between changes, eliminates the danger of the body louse on one's person. A person sick with typhus cannot convey it if there are no lice about, and so, with this knowledge in our possession we can, if we care to be laconic, reduce the description of the quarantine measures against typhus fever to just four words—simply, no lice, no typhus.

This is an outline of how quarantinable and other diseases are prevented at ports of embarkation and on the borders—it is an outline of our defense against disease invasion—it shows briefly the state of our preparedness against medical assaults from foreign shores. The defense is not perfect—it might be improved upon, but such as it has it gives and no man can even begin to estimate the saving it occasions to our country, from a financial standpoint—the suffering it obviates from a physical standpoint and the mental sorrow and grief that are not, but might be, if these defenses do not hold out.

## ACUTE POLIOMYELITIS WITH SPECIAL REFERENCE TO MYOCLONUS.\*

By BERNARD OETTINGER, M. D., Long Beach, Cal.

The conception that infantile paralysis represents an inflammation of the anterior horns of the spinal cord gave place to one that other gray elements of this organ were also implicated and this view to the recognition of an infection involving the entire cerebrospinal axis. Hence some authorities now prefer the designation poliomyelencephalomyelitis. Although this title is descriptively more correct, the older term poliomyelitis is herein employed because less unwieldy.

Beyond a better understanding of its pathology our clinical conception of infantile paralysis too, has grown. But one form, the spinal type, was recognized until most recent years. Only since 1911 have types been identified compatible with the idea of a general infection of brain and cord, (together with enveloping membranes), yet with varying dominant features relating to one or another unit of the cerebrospinal axis. This modern view has been the direct result of careful studies in recent epidemics but the knowledge so gained may be applied to sporadic cases. Here, too, infantile paralysis encountered as a seeming meningitis or encephalitis or in the guise of a profound general infection without paralysis, has usually been otherwise clinically designated. Recognition of the last group, the so-called abortive type, is of great import from the viewpoint of incidence alone, being estimated at from 15% to 60% of all cases in some late epidemics. Standard text books consider our added knowledge in so far, but not even these take cognizance of early motor phenomena in poliomyelitis which may present. The latter deserve comprehensive clinical study as an aid in the diagnosis of abortive cases and connotatively, perhaps, of the preparalytic stage of classic spinal types. Two case reports are herewith submitted in respect to diagnostic problems thus suggested.\*\*

\* Read before the Long Beach Branch of the Los Angeles County Medical Society, November 24, 1916.

\*\* Although Flexner and Noguchi identified the causal organism of infantile paralysis in 1913, a crux in diagnostic difficulties as regards sole reliance upon bacteriological findings, has lain in the inability to recognize the bacterium with ordinary laboratory equipment because of its infinitesimal size. Almost a decade previously Scandinavian investigators had isolated a diplococcus from tissues of fatal cases and produced characteristic paralysis with cultures thereof in injected animals. These findings however were, on the whole, not confirmed. The entire question has now been reopened by American observers. September 30th of this year, Mathers<sup>1</sup> reported finding a gram positive microorganism in brain and cord tissue and mesenteric lymph nodes obtained from fatal cases. Corroboration followed in work done under the Mayo Foundation<sup>2</sup> and from the Pathological Laboratories of the Cook County Hospital.<sup>3</sup> Nuzum and Herzog found the microorganism, a streptococcus, in the spinal fluid of eight out of nine cases and in a later report<sup>5</sup> in forty-five out of fifty cases. That this microorganism is either the carrier of the real ultra-microscopic virus or what is more probable that

Case 1. A girl aged four years is seen in consultation on the fourth day of illness in bed. For a week, while up and about, gastrointestinal symptoms have been present. In dorsal decubitus the patient lies with both legs slightly flexed. She cries when these are handled, resists their complete extension but later when asked to kick down the covers, she fully extends the lower limbs. She does not sit nor stand on request but when held upright, again holds both legs flexed with toes just touching the bed. The arms are used normally. The child whimpers a good deal. The psyche is not involved, her attention being frequently engaged to tell what she would like to eat, how she would like to take a ride, etc. There has been no vomiting, headache nor convulsions. A range of fever from  $99\frac{1}{2}$  to  $101$  has persisted since in bed. At this time the skin is clear. (A few days later a macular rash appeared on the chest.) Both pupils react to light; there is slight photophobia but the conjunctivae are not reddened. No cranial nerve paralysis. Marked stiffness of the neck presents and movement of the head is painful but neither at this time nor later was the latter drawn back. An occasional râlê can be heard in the left lower lobe. At my first visit the presence of the right abdominal reflex is doubtful and the right patellar reflex can just be elicited. Thereafter I can elicit neither abdominal nor patellar reflexes. There is some but not marked hyperaesthesia of the skin. With the patient's attention otherwise attracted, the soles of feet can be stroked without pain. The legs are not, and later did not become paralyzed.† On holding either leg in my hand, I experience slight rigidity, a condition entirely at variance with the traditional thought of flaccid or hypotonic musculature in infantile paralysis. With this occurs a peculiar fibrillary tremor under the fingers. Upon my second visit two days later the child seems not so bright. Otherwise the symptoms are as before with this further exception. A brief examination now excites the patient. She cries violently and directly shocklike jerks of the head and extremities recur at short intervals. The child continues to cry and its distress is impressive.

The following conditions were considered, viz.: acute rheumatism, osteomyelitis, meningitis (tuber-

the easily visible coccus is the aerobic form and the ultramicroscopic bodies the anaerobic form of the same organism reflects, in general, conclusions held. Dixon,<sup>4</sup> however, states that studies undertaken by him in 1907 and 1910 resulted in finding this gram positive diplococcus in secretions from nose and throat and in culture from the spinal fluid in acute poliomyelitis cases. But the results of cultural injections of animals lead him to believe that although the constant presence of the diplococcus shows it has something to do with the causation of the disease and may be symbiotic in its relation to the principal agent, this germ is nevertheless not the chief etiological factor.

† However, after three weeks with the patient in dorsal decubitus there is, without paralysis, slight relaxation of the left peronei muscles.

culous or meningococcic) and poliomyelitis. Absence of redness and swelling and the fact that the joints were not involved ruled out acute rheumatism which condition would also have developed greater temperature. Palpation showed the epiphyses of the long bones not particularly tender which excluded osteomyelitis or epiphysitis due to other causes than septic infection. The fact that pain was not severe when the lower limbs were at rest spoke against all these conditions. A point noted was that all symptoms with the single exception of the neck stiffness referred to meningeal involvement of the lumbar region. Tuberculous meningitis might be excluded in the face of acute development of nervous symptoms yet absence of headache and vomiting. Also, because acute tuberculous meningitis is a basal affair some involvement of the cranial nerves would have been a likely occurrence. The same factors spoke against a meningococcic infection. Examination of the spinal fluid at the County Hospital definitely ruled out this entity. This procedure was denied us while the patient was at home, but the continued mental clarity, absence of cranial nerve involvement, localization of symptoms pointing to inflammation of the spinal meninges alone, together with the vanishing abdominal and patellar reflexes determined a diagnosis of acute poliomyelitis.

Case 2. A boy of  $2\frac{1}{2}$  years. A maternal grandmother died of osteomalacia. Father and mother well but the latter has an enlarged thyroid and slightly bulging eyes. Of the mother's family one brother died at 43 years of tuberculosis, one brother at 30 years of exophthalmic goitre, two sisters in infancy and three sisters and two brothers are living and said to be well. The mother is married seven years; no miscarriages. Two older children are well; these and the patient born at full term. All labors long and hard but accomplished without the use of instruments. During each pregnancy much vomiting up to and during parturition. Patient was well nourished at birth. The mother, who is intelligent, says that at three months the child had a fever; was fretful and restless. Soon after attacks passed through the body which would stiffen. When the spasm relaxed, the glottis opened and there was a crowing sigh. Following the spasm the left arm was held rigid for a time. After a few days a series of yet harder attacks of like character occurred. There was much sweating about the head. Now supervened short attacks in which the patient would lie very quietly, staring vacantly and then occurred quick jerking of the head and extremities. Following these paroxysms he could not be quieted for some time. At present he eats much and anything offered him. Bowels and bladder act normally.

Physical examination: The patient is in dorsal decubitus. The head in general is well shaped but the occiput is flat. The face is exceptionally handsome, the expression intelligent. It is said the child can speak a few words. The body is long; the legs and arms thin; the fingers noticeably slender but withal there is no emaciation. The

skin is of good color, fine and without a blemish. The left ear is smaller and the left eye slightly lower than are the same on the right side. The left bony thorax is somewhat smaller than upon the opposite side. Exact measurements of arms and legs are not made but there is no marked difference in their length. Patellar reflexes present; Babinski positive (probably of no moment in this instance). Abdominal reflexes absent. No paralysis of cranial nerves or those of the extremities but the musculature in general is hypotonic. When placed in a sitting position and held, as the patient cannot sit up without support, the head is held erect but the spine in the lower dorsal region bows with a posterior convexity and the abdominal muscles bulge laterally. There is no titubation of the head. Resonance is found over the upper sternal region (absence of thymus?). Chest and abdomen negative. The testicles are undescended.

At a subsequent visit the following events were noted while the patient was sleeping in his basket. The eyes are opened and the bulbi moved slightly. Then the head, arms and legs jerk in quick sequence. The child awakes, cries, is restless and directly athetoid movements of one hand and then the other are noted. Some time elapses before the babe is quieted. These attacks are said to be frequent and always uniform.

A full discussion of this case would carry us too far afield from the subject in hand. Suffice it to say in passing that if we view the laryngismus stridulous, spasmophilia in general, the extreme body length and sternal resonance in the thymus region as evidence of probable thymic involvement, we note occurrence of abnormal ductless glands in three generations of this family. Even so, however, this may mean no more in the present instance than lessened resistance to an infection which certainly initiated the patient's illness. The short time the patient was under observation he was given small doses of thymus gland without appreciable effect. No doubt also with the idea of improving calcium metabolism the family physician (in another state) had given the patient up to 36 grains of calcium chloride a day for weeks with no result beyond decided stomachic disturbance. The history of fever and epileptoid attacks at once suggested an encephalitis but the residual paralysis of abdominal muscles and spinal erectors in the lumbar region discover the true nature of the infection, viz.: acute infantile paralysis.

In considering the shocklike motor phenomena of these cases one recalls that poliomyelitis aside from paralysis presents the picture of meningitis or its counterpart due to intense hyperemia of the brain occurring in some severe infections. Again, motor symptoms have not been unremarked in meningitis or cerebral hyperemia as witness the "startings" of tuberculous meningitis referred to by Osler and the generalized tonic contractions of the muscles of the jaw, neck, back and limbs noted by Escherich usually as a sequel of some acute infection or occurring as an independent malady. However, such symptoms have been in-

terpreted (and no doubt correctly), as toxemic irritation of the motor cortex and have not been regarded as of specific diagnostic significance. For this reason Colliver's<sup>†</sup> comments upon the diagnostic import of early motor phenomena in infantile paralysis is of considerable interest. He has remarked these in sixteen cases during the pre-paralytic stage. His observations are convincing in respect to variety of motor phenomena noted but they fail to give, as I believe, entirely concrete impressions of movements seen.† I put to one side the tremor noted in case 1, being doubtful if it should be classed in the category which Colliver depicts and indeed, in the same respect, I am not entirely certain regarding the dramatic and shocklike jerking of head and limbs which was common to both cases. Yet it would seem this may be identified as "twitching which may affect the whole body and in the beginning lasts less than a second." In any event, muscular spasms of this character occurred in both instances during the acute stage of the disease and once as a residual symptom. The phenomenon comprehends a typical *myoclonus*. This symptom has been defined as "involuntary, unsystematized, arrhythmic, quick, muscular contractions similar to that produced by an electric shock. They may be localized or disseminated and may embrace a muscle, a muscle group or only a few fibres" (Church and Peterson). In this connection we recall that myoclonus sometimes occurs with epilepsy comprising the "association disease" myoclonus-epilepsy, and again, that between myoclonic paroxysms, tremor of the same muscles may present sometimes fibrillary in character (so-called live flesh). It is also true that myoclonus is best known as

† Colliver says: "The symptom referred to is a peculiar twitching, tremulous or convulsive movement of certain groups of muscles lasting from a few seconds to less than a minute. The amplitude of vibration is greater than a tremor, not so constant and long as a convulsion and more regular than mere twitching, yet it has some elements of all of these. It usually affects a part or whole of one or more limbs, the face or jaw, but it may sometimes affect the whole body. The symptom may readily be overlooked in the beginning as it usually lasts less than a second and unless the patient is disturbed does not recur oftener than every hour or so. Later, the duration of the spells lengthens to a few seconds, recurring also at shorter intervals. This condition is often accompanied by a peculiar cry similar to the hydrocephalic. At times there is a slight convulsive movement "just like a chill," as the mothers say, during which time the child is apparently unconscious with eyes set for a few seconds and then he apparently becomes perfectly normal again. This brief unconsciousness during which the child's eyes are set, may occur without noticeable convulsive movements. It acts thus something like a petit mal. I have observed it as a twitching of the lips with tongue running in and out and a working of the jaw, preceding bulbar cases. The least stimulation of the skin is followed by slight convulsive movements with rigidity of the arm, fingers separated and wrist flexed (athetoid movements?). When the patient turns in bed, through either an external stimulus or an effort to coordinate, the movements are quick and jerky accompanied usually with slight convulsive movements of the limbs. The least noise produces in certain cases short series of convulsive movements similar to those in strychnine poisoning only not so general. This symptom seems to be similar to the infection neuroses described by neurologists of which tetany and chorea are good examples." This description covers a wide latitude of motor phenomena, viz.: a range of muscular contraction from tremor to convulsive movement of the whole body, and spasm both tonic and clonic. Colliver states that practically no reference to this symptom can be found in the literature of poliomyelitis but that both Zappert and Wilbur noted muscular twitching in the limbs. Jerking of the limbs and head better describes the particular movements observed in the cases here recorded.

a clinical entity, acute or chronic, of unknown etiology and that it has the tendency to subside after many months during which remissions and exacerbations may have been experienced. However, what is of particular interest to the subject in hand, is the precedent observation of myoclonus in acute infectious disease, viz.: in Dubini's disease, otherwise known as *electrical chorea*. The meager epidemiology of this affection records a 90% fatality. First described in 1845 in reference to cases which occurred in malarial districts of Italy, it was for a time thought to be of paludal origin. Its etiology, however, has remained obscure. So much as is known of the pathology of electrical chorea comprises "pulmonary and splenic congestion, inflammation of the meninges, increase of cerebro-spinal fluid, cerebral congestion especially at the base and softened foci in the cortex and great ganglia (Church and Peterson).<sup>7</sup> The brief clinical descriptions available refer to rythmical movements, as if from an electric shock, in the extremities and rarely in the head and face. Fever may be present. Pain in the head and neck may be an early symptom. Sensibility is not greatly affected but hypersensitiveness may easily be evoked and this exalts the motor phenomena. Epileptiform attacks may occur. In some cases paralysis may supervene and toward the end of the attack atrophy of muscles may be apparent (Church and Peterson; McCarthy<sup>8</sup>). The foregoing suggests the interesting possibility that infectious electrical chorea is really acute poliomyelitis with myoclonus as a dominant feature. The further study of motor phenomena which may appear early in acute poliomyelitis seems indicated. While doubtless in no way pathognomonic, such manifestations may prove a clinical aid at a time when diagnostic difficulty is the rule.

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## WAR DEPARTMENT

HEADQUARTERS WESTERN DEPARTMENT  
Office of the Department Surgeon

San Francisco, Cal.

April 19, 1917.

Dr. Sol Hyman,  
Editor, California State Journal of Medicine,  
Butler Building,  
San Francisco, Cal.

Dear Doctor:

In anticipation of the early legislation by Congress to call five hundred thousand men at once

and five hundred thousand more within the year into active training and service, and, in view of the necessity for the immediate enrollment of a large number of the younger medical men of the country in the Medical Reserve Corps for service with these troops as regimental surgeons and assistants, ambulance companies, field hospitals, etc., I would appreciate any publicity you may be able to give in your columns relating to this matter. Information and all necessary blanks can be obtained from me either at the Department Surgeon's Office or at the Letterman General Hospital.

Very truly yours,

Signed: GUY L. EDIE,  
Colonel, Medical Corps,  
Department Surgeon.

### SYNTHETIC SUBSTITUTES FOR COCAIN WITHDRAWN FROM FEDERAL REGISTRATION.

On page 129, Department of Pharmacy and Chemistry, attention was called to the decision of the United States Circuit Court of Appeals, holding that synthetic substitutes for cocaine and eucain did not come under the jurisdiction of the Harrison Act.

Below we print the letter of instructions of the Treasury Department in conformity with this decision:

B.C.K. TREASURY DEPARTMENT.

Office of Commissioner of Internal Revenue,  
Washington.

March 28, 1917.

M-n. Mim. No. 1497. Suspending enforcement  
T. D. 2194, relating to synthetic substitutes for cocaine.

To the Collectors Internal Revenue, Revenue Agents, and Others Concerned:

Referring to T. D. 2194, holding that any synthetic substitute for cocaine, alpha or beta eucain, or their salts or derivatives, comes within the provisions of the Act of December 17, 1914, and that persons using or having in their possession any such synthetic substitute are required to register and obtain such substitutes upon official order forms and otherwise conform to this act, this office has decided to suspend the enforcement of the ruling of April 26, 1915, until you are otherwise advised.

This action is taken in view of the decisions of the U. S. District Court, Southern District of New York, of June 28, 1915, and of the Circuit Court of Appeals for the Second Circuit, of February 21, 1916, holding that these synthetic substitutes did not come within the provisions of section 1 of the act.

Therefore, you are directed to notify all registered persons in your district or others who may be affected by T. D. 2194 of the suspension of this ruling.

W. H. OSBORN,  
Commissioner.

Approved:

W. G. McADOO,  
Secretary.

## Society Reports

### CONTRA COSTA COUNTY.

The regular meeting of the Contra Costa County Medical Society was held on Saturday evening, March 24, at the residence of Dr. W. E. Cunningham.

The society was called to order by its president, Dr. P. C. Campbell. Those present at the meeting were Drs. C. L. Abbott, G. M. O'Malley, P. C. Campbell, W. E. Cunningham, H. N. Belgum, C. C. Fitz Gibbon, H. L. Carpenter, C. E. Camp, J. T. Breneman, W. W. Frazer, Hall Vestal, E. W. O'Brien and U. S. Abbott.

The minutes of the previous meeting were read and approved and the usual business of the society was transacted.

Dr. Henry Harris of San Francisco read a most entertaining and instructive paper on "Blood Pressure—its Physiology, Prognosis, Diagnostic Value and Treatment."

After an elaborate Dutch luncheon was served the meeting was adjourned to meet again May 26.

Fraternal yours,

C. L. ABBOTT, Secretary,  
Contra Costa Medical Society.

### KERN COUNTY MEDICAL SOCIETY.

#### Report of Meeting of March 16th, 1917.

The Kern County Medical Society was called to order by President F. J. Gundry at 8:30 p. m. at the City Manager's Office, City Hall, with 50 per cent. of the membership present.

After the usual routine business, Dr. Ralph Williams of Los Angeles was introduced to the Society by the President. Dr. Williams held a dermatological clinic for a half hour, then presented a paper, "The Relation of Dermatology to General Medicine." A general discussion followed which continued until 11 o'clock, when an enthusiastic vote of thanks was tendered Dr. Williams, with the wish that he might be with us at some future date.

The meeting adjourned after a resolution was passed to hold the next meeting on May 18, 1917, as the meeting of the State Society conflicts with the April date.

C. A. MORRIS, Secretary.

### LOS ANGELES COUNTY.

#### Eye and Ear Section.

Attendance—Drs. Bullard, Brown, Davies, Dudley, Dilworth, Detling, Griffith, Graham, Kyle, Libby, Lund, T. J. McCoy, Geo. W. McCoy, R. W. Miller, Montgomery, Old, Rogers, Stivers, Sweetman, Tholen and True.

Visitors—Drs. Browning, McKellar, Bogue, Endleman, Cummings, Gage, Crane, Strader, Singleton and Henninger.

Minutes of the previous meeting were read and approved.

The following cases were reported:

Dr. True—Small papillomatous growth center: boy's tongue, hard, anterior half looked like angioma, posterior half is too fibrous to be angioma, there are no symptoms, no hemorrhage, no pain.

Dr. T. J. McCoy showed a case of Xanthelasma Palpebrarum, very extensive, in which chromic acid is being used with much success, on probe passed into the growth. In 39 cases treated by him over a period of 20 years, he has never had a case where chromic acid did not restore the normal pink color of the skin.

2nd case. Iridectomy.

3rd case. Foreign body in the eye.

Dr. Stivers reported a case of Innominate Aneurism with laryngeal involvement.

Dr. Roland Cummings read a paper on "General Considerations of Focal Infections."

Dr. Julio Endleman read his paper on "Focal Infection from the Dentist's Standpoint."

Dr. Montgomery read his paper on "Sinus and Mastoid in Focal Infection."

Dr. Stivers read his paper on "Tonsil and Adenoid in Focal Infection."

#### Discussion.

Dr. Tholen—Mouth. In the mouth and teeth are frequently found foci of infection. The X-rays are very useful in diagnosis.

Dr. Browning—Mouth infection in tubercular patients, a point well brought out in Dr. Stivers' paper, relieve one condition and others subside. Dentist work is sometimes incomplete, foci should all be cleaned up.

Dr. Brown—Tonsils are affected most commonly because of their position and their poor drainage. In deciding whether patients' tonsils should be removed or not I consider the previous history. Had one patient with many attacks of iritis due to tonsil infection. Iritis cleared up after tonsil removal. In chorea we do not get good results because the cervical glands will, if infected, keep up the systemic infection. Tuberculosis fairly common in adenoid cases, 17 in 1000 cases. My experience satisfies me to go on with further work in this line.

Dr. Sweet—We should have some understanding of the work with the dentist in the cases we refer to him. Should have X-ray taken.

Dr. Montgomery—Dr. Stivers' paper recalls an attack of acute appendicitis following tonsillitis, also case quincy, incised four times by general physician. Tracheotomy done by me to give air but patient died of acute streptococcal infection.

Dr. Endleman—I wish to ask Dr. Montgomery whether I understood him to say "Teeth cause abscesses in the body but the teeth are not abscessed by general bodily conditions." My answer to that would be no. Abscess of the teeth can occur from general bodily condition, but usually this is a single abscess.

Dr. Rogers asked Dr. Cummings what is the chief source of cough in focal infection, what nerves, etc.

Asked Dr. Brown if in iritis acute to promptly remove the tonsil would not be too radical? It would lower patient's vitality and set up further infection.

Dr. Detling—Dr. Stivers went into physiology of tonsil thoroughly and I was glad to hear it. In my work at Children's Hospital I find that children are referred by physicians and nurses for trivial conditions. I refuse to operate on children under 6 or 7 years, unless some particularly abnormal conditions.

A vote of thanks was given to Drs. Endleman and Cummings for their courtesy in coming before this section with interesting papers.

Dr. Cummings (in closing)—We see very little trouble in freely drained extra-osseous foci, they are well drained. The intra-osseous on the other hand is not well drained. The tonsil is badly drained so much scar tissue, etc., makes them the most common source of focal infection.

Dr. Endleman—Disagree with Dr. Cummings as to the extra-osseous focus, it is not freely drained. Clinical results are very convincing.

### MENDOCINO COUNTY.

At the call of the president, Dr. Frank C. Peirsol, a meeting was held at Albion, in the office of Dr. H. H. Wolfe, on February 10, at 8 p. m. Dr. R. H. Hunt of Bartlett Springs, Lake County, was elected to membership. A committee, consisting of Drs. Hunt, Rea and Stout, was appointed to get in contact with the Lake County physicians

and to invite them to become members of this society. A resolution passed instructing the Secretary to write our legislators to work and vote according to the recommendations of the Medical Society of the State of California.

Dr. Campbell read a paper on scarlet fever.

Dr. C. Francis Baker contributed a paper entitled, "A Brief Study on Preventive Medicine."

Those in attendance were Drs. F. C. Peirsol, L. C. Gregory, H. O. Cleland, F. McL. Campbell, H. Peddicord and O. H. Beckman.

Sincere thanks to our host, Dr. H. H. Wolfe, who banqueted us in regal style. I hope the stream of life will always give him a favorable tide.

OSWALD BECKMAN, Secretary.

#### SAN DIEGO COUNTY.

Dr. George H. Kress, president of the State Society, and Dr. Clarence E. Moore, Councillor for the Second District, visited San Diego on the evening of February 24th and enjoyed the hospitality of the San Diego County Society. Dr. Moore presented an able paper on calculus of the ureter and kidney, illustrated by stereopticon with radiograms. President Kress addressed the meeting on the detail planning necessary for successfully handling the State convention. He expressed himself as well pleased with the arrangements being made by the local committee and predicted a splendid gathering in April.

The San Diego County Supervisors have advertised for tentative plans for a County Tuberculosis Hospital to be built in such a manner that the same may be added to from time to time.

The Medical Library, through the courtesy of the management of the Timken Building in which it is located, has been given an extension quarters which was very much needed.

#### SAN JOAQUIN COUNTY.

The regular monthly meeting of the San Joaquin County Medical Society was held at the residence of Dr. J. D. Young on Friday evening, February 23. In the absence of the president, First Vice-President R. T. McGurk was in the chair. Those present were Drs. R. T. McGurk, H. C. Petersen, F. Conzelmann, J. T. Davison, B. F. Walker, H. J. Bolinger, E. B. Todd, Mary Taylor, N. E. Williamson, L. Dozier, S. P. Tuggle, H. E. Sanderson, R. R. Hammond, J. D. Young, Hudson Smythe, Margaret Smyth, E. A. Arthur and D. R. Powell, with Dr. Allan Powers of Tracy and Dr. Frank L. Kelly of Berkeley as guests.

Following the business session, the chairman introduced Dr. Frank Kelly of the State Board of Health, who read a paper on the "Epidemiological Control of Diphtheria," in which he spoke of the necessity of detecting the carriers and controlling them until such time as they were cleared up. He also spoke of the Schick reaction as a ready means of dividing those exposed into immunes and non-immunes and the consequent saving in the amounts of anti-toxin necessary as prophylactic doses, in that the immunes would not need such protective measures. Dr. Williamson of the State Hospital spoke of his experience in the control of diphtheria in that institution, with particular reference to the assistance of the Schick reaction. Drs. Petersen, Arthur, Taylor and Davison also joined in the discussion. Dr. D. R. Powell spoke of several cases of laryngeal diphtheria in two of which emergency tracheotomies had been necessary.

There being no further discussion, the meeting adjourned to enjoy a delightful repast.

The regular monthly meeting of the San Joaquin County Medical Society was held at the residence

of Dr. J. D. Dameron, Friday evening, March 30, President Charles R. Harry presiding. Those present were Drs. C. R. Harry, B. F. Walker, E. A. Arthur, J. D. Dameron, Mary Taylor, R. B. Knight, C. D. Holliger, J. T. Davison, L. Dozier, C. F. English, G. G. Hawkins, Minerva Goodman, Margaret Smyth, A. E. Edgerton, J. V. Craviotto, and Dr. R. Powell with Dr. McCloskey as guest.

A committee of five was appointed, to be known as the Auxiliary Medical Defense Committee of San Joaquin County and to co-operate with the Medical Committee Council of National Defense. The president also appointed a committee of five with the City Health Officer as ex-officio member to confer with parties interested in the establishment of a certified dairy to supply the city of Stockton.

At the conclusion of the routine business, the scientific program consisting of a symposium on "Meningitis" was taken up. The first paper by Dr. J. D. Dameron was on Etiology, Pathology and Symptomology; the second paper by Dr. Craviotto on the Prognosis and Treatment, in which he manifested particularly the advantages to be gained by heroic doses of antimenigitic serum; the third paper by Dr. A. E. Edgerton on Meningitis of Otitic Origin. The papers were discussed respectively by Drs. Arthur, Harry and Powell, following which there was general discussion by most of the members present.

At the conclusion of the discussion, the meeting adjourned to enjoy a social repast.

DEWEY R. POWELL, Secretary.

#### PROCEEDINGS OF THE SAN FRANCISCO COUNTY MEDICAL SOCIETY.

During the month of March, 1917, the following meetings were held:

##### Tuesday, March 6—Section on Medicine.

1. Aortic Disease; Demonstration of Case. G. E. Ebright.
2. Some Interesting Chest Cases. H. P. Hill.
  - (a) Abscess of the Lung, with Development of Acute Penetrating Gastric Ulcer.
  - (b) General Empyema, with Development of Pleurocutaneous Fistula and Bronchial Fistula.
  - (c) Obstruction of Left Bronchus with Aneurysm Perforating Bronchus (two cases).
3. (a) Sarcoma Following Traumatism.  
(b) Acute Suppurative Cellulitis of Stomach. Emmet Rixford.
4. Case of Erythromelalgia. S. R. Dannenbaum.
5. Fracture of the Neck of the Femur. H. A. L. Ryfkogel.

##### Tuesday, March 13—General Meeting.

Report of a Case of Little's Disease. Rhizotomy (Foerster's Operation). Correction of Deformity by Orthopedic Measures. Re-education. Condition Before and After Treatment Shown by Motion Pictures. Walter F. Schaller and H. L. Langnecker.

##### Tuesday, March 20—Section on Surgery.

1. Gastroenterostomy. C. W. Lippman.
2. Carcinoma of Rectum. (Illustrated by lantern slides.) Harold Brunn.
3. Tendon Suture; Demonstration of Cases. Sterling Bunnell.

##### Tuesday, March 27—Section on Eye, Ear, Nose and Throat.

1. Presentation of Cases:  
H. B. Graham. (a) X-ray of Fracture of Skull Through Cribriform Plate. Including Frac-

- tures of Anterior Walls of Both Frontal Sinuses.  
 (b) Stereoscopic Picture Showing Normal Skull Which Simulated Lues.  
 Hans Barkan. Amyloid Degeneration (?) After Injury.  
 K. Pischel. Case of Sympathetic Ophthalmia.  
 H. McNaught. (a) Healed Tuberculosis of One Ear; Active Tuberculosis of the Lung and Larynx.  
 (b) Carcinoma of Tonsil.  
 (c) Carcinoma of Larynx.  
 (d) Anomaly of Fork Test; Bone Conduction Referred to Left Ear; Vestibular Function Active in Left Ear; Infinite Negative Rinne Left Complete Deafness.  
 (e) Specimen of Brain Abscess Following Chronic Otitis Media.  
 J. F. Smith. Glaucoma Following Cataract.  
 2. Preliminary Report of the Bacteria Found in Tonsils. B. Jablons.  
 3. .... J. G. Sharp.  
 4. Microbiology of the Buccal Cavity in Relation to Distant Foci. K. F. Meyer.

RENE BINE, Secretary.

#### SISKIYOU COUNTY.

The Siskiyou County Medical Society held its regular quarterly meeting in Montague, Monday afternoon, 3:30 p. m., April 2. Dr. Will Tebbe, president pro tem., occupied the chair. Those present were: Drs. Hal Warren, Chas. Pius, Geo. Hall, W. F. Shaw, G. W. Hathaway, G. W. Dwinell, Will Tebbe and J. Roy Jones.

A report was given by the committee, Drs. Pius, Shaw and Jones, on health insurance. No recommendation as to the action to be taken by this society was given.

Dr. C. W. Nutting was elected as a delegate to the meeting at Coronado. Dr. G. W. Hathaway read a paper on "The Cystoscope and the Vesical Stone," which was discussed at length.

The next meeting was voted to be held at Shasta Springs on July 2d.

J. ROY JONES, Secretary.

#### TULARE COUNTY.

At the monthly meeting of the Tulare County Medical Society, held in Visalia on the evening of March 20, Drs. H. J. Willey of Porterville and G. A. Clapp of Lindsay were duly elected to membership.

There was a splendid attendance at this meeting and Dr. Walter V. Brem of Los Angeles, the guest of the society, gave a very interesting and instructive talk on the "Treatment of Syphilis."

In view of the fact that the meeting of the State Society is to be held in April it was voted to omit the April meeting of the County Society.

ADDISON W. PRESTON, Secretary.

#### LANE MEDICAL LECTURES FOR 1917.

The Lane medical lectures for the year 1917 will be delivered by Dr. Simon Flexner, director of Laboratories of the Rockefeller Institute for Medical Research, during the week beginning Monday, October 8. There will be five lectures in all and they will be given on consecutive evenings, at 8 o'clock. The subject of the series will be: "Physical Basis and Present Status of Specific Serum and Drug Therapy."

### Book Reviews

**Practical Uroanalysis.** By B. G. R. Williams. Illustrated. St. Louis: Mosby. 1916.

An excellent little manual for the routine examination of urine for the student and general practitioner. The tests are all practical and the simplest and most reliable are selected for use. The interpretations are conservative and to be depended upon. This little book can safely be recommended for general use after the student has been trained in the various methods to be learned in the clinical laboratory. On the whole, the book is a dependable epitome of the best modern methods both as to reliability and interpretation.

G. H. T.

**Public Health Nursing.** By Mary Sewall Gardner, R. N., with an introduction by M. Adelaide Nutting. New York: Macmillan. 1916. Price, \$1.75.

While the medical profession has been developing the social aspect of its work, and we have hygiene and preventive medicine added to our activities, the nursing profession has not been idle, as can easily be ascertained from the important work on public health nursing from the pen of one of the pioneers in this field. Miss Gardner has given us a very fine exposition of the mechanism of organized nursing. The history of public health nursing, from earliest times down to date; organization, administration and personnel of visiting nursing; and the special branches of public health nursing; are the main divisions of the book. Most thoroughly gone into are the questions of the type and training of the women who are to be nurses, devoting themselves to this branch of nursing. There is an intimate knowledge of the social service side of nursing that would be of interest to all who are connected with clinics, especially clinics with nurse service and visiting in the homes of the patients. The sub-headings under the specialties include tuberculosis nursing, child welfare nursing, school nursing, mental hygiene nursing, industrial nursing and medical social service. On all of these subjects the comment is keen and the discussion of the principles of the work clear and thoughtful. For all those to whom the subject of public health is of interest this book is to be recommended as a most illuminating and stimulating commentary.

G. H. T.

**Focal Infection.** Lane medical lectures by Frank Billings. Delivered September 20-24, 1915. Stanford University Medical School, San Francisco. Published New York and London: D. Appleton & Co., 1916.

While this topic, new as it is, has already undergone many changes, it is a matter of some satisfaction to read what constitutes one of the very first authoritative and comprehensive statements on this subject. On reading the lectures slowly, one is impressed by the enormous amount of work done in the chemical, bacteriological, pathological and biological laboratories and at the bedside, by the brilliant group of men, whose joint labors produced this new, yet already well-established hypothesis of the etiologic relation of focal infection to systemic diseases. The conferring of specific pathogenicity to the various strains of certain common micro-organisms and of specific elective tissue affinity for specifically cultured micro-organisms and, finally, the conception of the transmutability of the cocci of the streptococcus-pneumococcus group form a triad of epochal thoughts that must be accorded the serious attention of all interested in medicine and the sister sciences. The five lectures that constitute the series contain a world of material and, read at leisure, supply one with a very complete resumé of all that has been done in this line up to the time of the lectures.

G. H. T.

**The Clinics of John B. Murphy, M. D.,** at Mercy Hospital, Chicago. (Volume IV, Number VI. December, 1916. Octavo of 238 pages with 72 illustrations. Philadelphia and London: W. B. Saunders Company, 1915. Published Bimonthly. Price per year: Paper, \$8.00. Cloth, \$12.00.

Contents—Portrait Dr. John B. Murphy; Editor's preface; In memoriam Dr. Murphy; Medical history and last illness of John B. Murphy; Osteosarcoma; Ancient injury of skull with focal signs; Harelip; Chiloplasty; Angioma of lip; Series of unclassified illustrations showing certain phases of Dr. Murphy's work; Toxic goitre with melancholia; Exophthalmic goitre; Muscular sinus of arm; Posterior luxation of elbow; Operative reduction; Ununited fracture radius; Fracture phalanx of finger with vicious union; Carcinoma of breast; Sinus of abdomen from gangrene of lung; Submural abdominal abscess; Fibroid of uterus; Adoption of an attached pedicled flap for cure of an impassable stricture urethra; Hydrocele, Andrews' bottle operation; Ununited fracture of femur; Osteomyelitis of femur; Chronic eburnative osteitis of femur; Gun-shot wound of knee-joint with fracture external condyle and semilunar cartilage; Sarcoma of leg; Tuberculous tenosynovitis of peroneal tendons; Saline proctoclysis apparatus; Writings of Dr. John B. Murphy.

**My Birth.** The autobiography of an unborn infant. By Armenouhie T. Lamson. New York: The Macmillan Company, 1916. Price \$1.25.

The author seeks to dignify human reproduction and to replace superstition and shortsightedness by the fact of the science of embryology. The narrative is much clothed in fancy and sentiment and rather forced to make a point of fact. The effort to convey to the reader an attitude of mind toward the subject and to reconcile the conventional viewpoint with discomfiting procedures of nature, is rather too manifest, the tone being quite that of the purity literature which has flooded the press during the last decade and which, from a literary standpoint, is usually uninspired. This is unfortunate because the writer has a fair grasp of embryologic facts. The function of specialized cells, which is the essence of embryology, segmentation and nutrition of the ovum, are processes clearly described. Space is given to discussion of hereditary tendencies, deformity and determination of sex out of proportion to the validity of the scientific facts. Only confusion can be the result of discussion of the points which are still in question. In several places the knowledge of the writer falls short in explanation of cause and effect—for instance, in the metabolism of pregnancy and tubal pregnancy. There is also a tendency to under-rate present day pediatrics. On the whole, the book promises to arouse popular interest in the subject.

L. T.

**Diagnosis and Treatment of Abnormalities of Myocardial Function** with special reference to the use of graphic methods. By T. Stuart Hart, A. M., M. D. Illustrated with 248 engravings, 240 of which are original. New York: Reiman Company. 1917.

This little book of 320 pages should be of particular interest to the student or practitioner who desires a little more than ordinary information upon dysfunctions of the myocardium. The clinical value of the volume is much enhanced by the fact that function rather than structure is chiefly considered.

The earlier chapters are devoted briefly to the normal anatomy and physiology of the heart. Polygraphic and electro-cardiographic tracings of the normal are reproduced and interpreted, which

fact aids materially in interpreting the numerous tracings of pathological conditions considered in the later chapters. It is delightfully free throughout from technical terms and discussions, and its reading requires but little preliminary knowledge of graphic methods, for it frequently refers to the normal and compares it with the pathological.

Each type of cardiac irregularity is taken up in a separate chapter with discussion as to its etiology, clinical signs and attending prognosis. These are all illustrated by many fine tracings made both by the polygraph and electrocardiograph. The chapter on auricular fibrillation with the frequently accompanying ventricular insufficiency and pulse irregularity should alone recommend the book to every clinician. A lucid description (with charts) of the method of estimating "the average systolic blood pressure" is given in this chapter and its prognostic value becomes so evident that its estimation in every case of this kind would well compensate for the small amount of time required in making the readings.

There are 63 pages in the latter part of the book devoted to treatment which is taken up under the heads of rest, exercise, diet and drugs. The numerous footnote references are further augmented by a large terminal bibliography.

J. M. R.

**The Nervo-Muscular Mechanism of the Eyes and Routine in Eye Work.** By G. C. Savage, M. D. Published by the author, Nashville, Tenn. 1916. Price, \$1.00.

The preface of Dr. Savage's book contains a statement which alone is enough to discourage the reviewer from proceeding any further, namely, that "In all the domain of ophthalmology there is no other subject of equal importance with that of ophthalmic myology"; and this in view of the fact that ophthalmology embraces such interesting problems as the cause of glaucoma, the cause of choked disc and the relation of the eye to many general diseases.

However, we proceed with the review and find the book composed of a series of axioms which summed up mean only that both eyes must look directly at an object at the same time in order to see it sharply and as a single, not as a double object; a truism familiar to every medical reader.

To speak of a "fatal mistake of Helmholtz," unless it can be proven, is daring at the least; and if it is that Helmholtz chooses to take an arbitrary anterior pole of the eye from which to calculate the posterior, whereas Dr. Savage takes an arbitrary posterior, it will be left to some future student of the subject to decide whose fatal mistake it is.

Dr. Savage gives a number of centers of control of the ocular muscles which he plots and a series of diagrams he believes firmly establish the anatomical verity of these centers. While theoretically we cannot say that these centers may not exist as indicated, we do object to the dogmatic presentation of these centers as proven facts. They are not proven, and Dr. Will Walter in the Section on Ophthalmology of the American Medical Association in 1916, said very aptly in talking of the localization of control of ocular movements, "We are talking of physiologic levels, not spirit levels." In speaking of the eighteen conjugate centers standing ready at birth for action, Dr. Savage says, "One-half of these axones are to be forever inactive, as if dead wires, for the nine centers from which they go will never become generators and dischargers of neuricity"; one thinks one is reading an adverse criticism of some automobile engine.

The practical tests of muscular imbalances described, are familiar to all ophthalmologists and there is no criticism to be made of these, except perhaps, to say that the majority of practitioners

do not ascribe the great practical importance to them that Dr. Savage does; that is purely a matter of individual experience and judgment.

The small chapter on routine in eye work is interesting because it gives one the routine procedures of a practitioner of as long experience and of as high a standing as Dr. Savage. For those doing eye work as a specialty there is nothing to be learned from it, however, as we all have to adopt our own routine as our character, temperament and training leads us to it.

H. B.

**Handicraft for the Handicapped.** By Herbert J. Hall and Mertice M. C. Buck. New York: Moffatt, Yard & Co. 1916.

A book written from practical experience is always of value and especially on this important subject of employment for those of our patients who are suffering from nothing to do. This book very fully describes the essential points for the casual reader on the subject, and also many of the more detailed directions for the teacher or the patient. The variety of subjects covered enables us to choose the one most adapted to our individual needs.

Parts of the work as here described could be applied to cripples, convalescents from acute or chronic diseases not able as yet to go back to hard work, tuberculous patients in an arrested stage, neurasthenics and some with more serious mental deficiency.

The authors take up the subjects of basketry, chair-seating, netting, weaving, bookbinding, cement-working, pottery, and light blacksmithing, and have appended a very considerable reference list of books going into more detail on many of these subjects. In the chapter on basketry details are given as to the kind and size of reeds to use, how to prepare them for use and diagram illustrations of just how to weave them to produce certain baskets and forms. Pictures are shown that make chair-seating appear very easy. Different knots employed in netting and numerous suggestions as to articles that can be made are of help in that section. Weaving requires a larger apparatus than some of these other arts, but this too is carefully described. Bookbinding, although quite a complex process, is carefully outlined and pictured. In this, as in the other arts and crafts, a little practical instruction will aid materially the suggestions in this book. There is considerable difference between cement work and pottery, the former requiring no kiln or expensive lathes and consequently producing a cruder, but a nevertheless, serviceable set of articles. Blacksmithing does not refer to shoeing horses, but to making useful household wares, such as andirons, pokers, heavy latches, etc.

And so readers of this book will find that Dr. Hall and Mertice Buck have from their own experience at Devereaux Mansion, Marblehead, and elsewhere, suggested many practical occupations that are a pleasure as well as a stepping stone to self-reliance and health.

P. H. P.

#### DEPARTMENT OF BACTERIOLOGY AND PATHOLOGY.

(Edited by Benjamin Jablons, M. D., San Francisco.)

[This department has as its chief object the dissemination of the special knowledge that is being developed in the scientific laboratories of the world, and which are of practical interest to the medical practitioner. Abstracts of general articles will be published from time to time as well as preliminary reports of subjects that are of universal interest.]

##### Complement Fixation for Tuberculosis.

To appreciate the factors entering into the Complement Fixation Reaction for Tuberculosis it is

necessary to keep two points in mind; first, the reaction of the human organism to the tubercle bacillus and its derivatives and, second, its reaction to the tissue products resulting from the action of the tubercle bacillus. It is known that the introduction of the foreign protein of whatever nature into the body calls a specific and non-specific response. The specific reaction is that evidenced by the mobilization of an antibody, whose nature may be that of either an agglutinin, a precipitin, a bactericryptin, an opsonin, a bacteriolysin or a complement fixing antibody. Then the non-specific antibodies may also be mobilized and these are chiefly of the ferment and anti-ferment variety. In order therefore to diagnose the presence of an organism that is sufficiently active to call forth a response from the infected body, it is necessary to seek for one or even all of these antibodies.

Datta, in an article published July, 1915, in the Policlinico, summarizes his studies in sixty tuberculous patients in whom parallel observations were made of a skin tuberculin reaction, agglutination precipitin and complement fixation test, using two different technics for the latter. He found that the skin tuberculin reaction was the most constant in all cases of pulmonary tuberculosis, excepting those that were more advanced. The fixation of complement came next in order of frequency and was most constant in the graver cases. The agglutinins and precipitin tests never gave independent positive findings but trailed the others, giving positive findings occasionally in the milder cases. He advises for diagnosis and prognosis of tuberculosis, that the skin tuberculin test plus the complement fixing reaction be employed. Krause's recent publications on the studies of the skin reaction in the immunized guinea pigs conclusively prove the contention of many observers that the supersensitiveness to tuberculo protein after pre-existing infection is never entirely lost even after healing excepting in the presence of intercurrent diseases. This naturally increases the limitations of this test as a diagnostic factor for the determination of an early active tuberculosis.

Theobald Smith, in a recent number of the Journal A. M. A., states that agglutinins and precipitins are constant in spontaneous infections with the tubercle bacillus; the opsonins are, however, slightly reduced or fluctuating. Complement fixing bodies are never present in healthy individuals, but occur in 68% of those infected. This has been disproved by most of the recent work. Opsonin determinations have been discarded since the early reports of Wright owing to their inconsistency and the fluctuations produced by auto-infection.

Complement deviation still remains the most delicate test for the detection of the presence of an antibody producing substance. Its delicacy is such that even minimal amounts of proteins can be recognized when brought in contact with their specific antibodies in the presence of complement. This accounts for the strenuous efforts immunologists have made to apply this test to the diagnosis of tuberculosis since Bordet and Gengou first described their phenomenon.

A great deal of interest has been aroused recently in the subject owing to the fact that several investigators claim to have attained the goal which they had been striving for since the earliest reports of the work of Wassermann and Bruck. The chief difficulty was to obtain a suitable antigen which would react with the antibodies produced as a result of an infection with the tubercle bacillus. This if obtained would solve the problem of early diagnosis of tuberculous infection and also determine whether a definite cure was present. The difficulties encountered can best be seen from a review of some of the work of various investigators. In the early days of the test the various

preparations of tuberculin were used, although in 1901 Widal and Lesmond, who first carried out complement fixation tests on tuberculosis, used homogeneous emulsions of tubercle bacilli of the A. C. type. Old tuberculin which, as you know, is practically a fifty per cent. glycerin extract of the soluble products of the metabolism of tubercle bacillus, was used by Wassermann and Bruck in the demonstration of the antibody after tubercular infection, but gave no satisfactory results in diagnosis.

Bacillus emulsion consisting practically of the insoluble components of the tubercle bacillus was used, but the results obtained were of no great value because the early cases failed to react. This manifestly rendered this substance a poor antigen for this method of investigation.

The detection of the antibody developed by the human organism against infection with tuberculosis is surrounded with many difficulties. Present knowledge justifies the assumption that there are several antibodies developed against tubercular infection. Bergel, who studied the effect of the lytic substances within the peritoneal cavity of the white mouse upon the tubercle bacillus, claims that the bacillus is made up of several layers, the first being a wax-like mantel which is strongly acid and alcohol resistant. Beneath this mantel there is another layer which consists for the greater part of a mixture of lipoids and fatty acids which contain wax granules. Within these layers there is another layer consisting entirely of neutral fat which is arranged in rows of granules bound together by thin fibers. Beneath this the albuminous nucleus of the tubercle bacillus rests, and according to Bergel, each of these layers has a different staining reaction and a different chemical composition, thus we can see that the body must react by the production of the tubercle bacillus. In addition it may be supposed that the necrotic caseated focus represents a foreign body from the standpoint of tissue cells and probably calls forth the production of antibodies. These features explain the varied attempts upon the part of many investigators to produce a suitable antigen to determine the presence of complement fixing bodies in the circulating blood.

Much's work was based practically on this principle, and Much on this basis prepared four partial antigens, the first being lactic acid extract, second an alcoholic, third an ether extract, and finally fourth, the protein residue. The lactic acid extract was discarded, but the three remaining antigens were used. These antigens failed to give constant results, some tuberculosis sera reacting with one, while others would react with another of these antigens. The only fact of interest is that Much, in immunizing animals and individuals, drew the conclusion that there was no humoral immunity present in tuberculosis, but that it was chiefly of a cellular nature. In other words, antibodies were not thrown out into the blood stream excepting when an excessive reaction to the bacillus had taken place. His results prove that the partial antigens are similarly of very little value in the early diagnosis of the disease, although it opens up an interesting line of investigation into the human body's immense response to tuberculosis.

Besredka in 1913 published his results in tuberculosis fixation, using as an antigen a filtrate derived from a medium consisting of a mixture of bouillon, egg-white and egg-yolk, in which tubercle bacilli were grown. His results were most encouraging excepting for the fact that the samples of tuberculin obtained in this way varied in their antigenic qualities. Another source of error was that this antigen gave cross-fixation with leucic sera. This was at first thought to be due to the lipoids contained in the media, but Brofenbrenner, who is foremost among those who have investi-

gated this antigen in the United States, found that positive reactions occurred with certain syphilitic sera even after the lipoids had been extracted from it. Brofenbrenner has also recently proven that a syphilitic serum after being brought in contact with antilipotropic substances which will absorb these will subsequently give a fixation with the Besredka tuberculin which argues for the specific nature of the test. Inmann, Kuss, Leredde and Rubenstein found this antigen to be non-specific.

Calmette and Massoll in 1912 devised a water and peptone soluble antigen which gave very reliable results. The water soluble extracts give fixation in the late stages of the disease, whereas, the peptone soluble extracts gave fixation in the early stages of the disease.

Stimson of the Public Health Laboratories is perhaps the only one of the American investigators previous to 1915 whose investigations of the subject have gained any attention. Stimson had undertaken a fairly extensive and thorough trial of the Besredka and Calmette peptone-water soluble extracts and his conclusions are as follows:

Depending upon the antigen and the technic employed, the proportion of tuberculosis cases where positive fixation will be demonstrated will vary from a maximum of some 95 per cent. down to a much lower figure. While these antigens and technics giving the higher percentage of positive results are more valuable in confirming suspected and detecting unsuspected cases, they tend to approach such tests as that of the von Pirquet in failing to afford much information as to the stage, extent and activity of the tubercular process, nevertheless the continued presence of reactive bodies in the serum of a given patient on repeated examination, when no antigens have been artificially administered is, he believes, strong presumptive evidence of continued or recent activity of the lesions. It is striking that the antigens employed seem to have given excellent results in the hands of the original investigator, but in many instances these results could not be confirmed when used by other workers.

Among other antigens are to be mentioned the alcoholic antigen of Dudgeon, Meek and Weir, and Hirschfelder's pepsin antigen as well as the tissue antigens prepared from normal and tubercular tissues. According to many workers the least criticized antigen is an emulsion of living virulent tubercle bacilli which obviates the occurrence of non-specific reaction. These constitute the basis for the antigens used by Caulfield, Laud, Fraser, McIntosh, Filde, Radcliffe and others.

Irons and Nucoll used autolysates in the sero diagnostic test of gonorrhea. This has led Corper of the Municipal Sanatorium of the City of Chicago to seek products derived from autolysis of tubercle bacilli as antigen for this test. He found that liberation of nitrogenous substances after eight to ten days' incubation reached its maximum on the tenth day, and that the anticomplementary titre as well as the fixing titre increased from day to day up to the tenth day. At that time one one-hundredth of the original titre of the emulsion was found sufficient to bind the complement into the presence of tuberculous sera. He carried out a series of tests in 361 persons and found that the complement fixation test with autolysate antigen for tuberculosis is not absolute, being positive in about 30 per cent. of all the clinically definite cases of both active and inactive tuberculosis, and concludes that the value of the complement fixation test for tuberculosis lies in the fact that, taken in conjunction with other findings, a definitely positive reaction makes the diagnosis of tuberculosis certain. It is of value also from a differential diagnostic standpoint in that it indicates tuberculosis, when positive, as against syphilis, carcinoma, ab-

sscess of the lung, empyema from other causes, bronchiectasis, etc.

The practical absence of a reaction in non-tuberculous cases makes this test, when positive, of far greater value in the diagnosis of tuberculosis than any of the biologic tests for tuberculosis thus far discovered. A positive test was never obtained in the absence of a positive von Pirquet reaction, but a large percentage of clinically normal individuals giving positive von Pirquet reactions were negative in fixation tests.

Craig modified the Besredka antigen by growing his bacilli in an alkaline egg broth and then extracting it with alcohol. The difference consisted largely in that the antigen was an alcoholic extract of the bacilli plus the medium in which they were grown minus the insoluble residue and precipitate left after extraction. In his last communication on this subject, he had modified his medium, growing tubercle bacilli on the surface of Bedders starch medium and subjecting it then to the same procedure as in his original communication. Since his results are very striking, it may be of interest to state them here. He tested 209 cases of tuberculosis of which 183, or 37.5 per cent., gave a positive reaction, and 26, or 12.4 per cent., gave a negative reaction. In 159 cases there was absolute inhibition while in 24 there was almost complete inhibition. He found 65 per cent. of fixations in cases considered inactive and argues that the test indicates the fallaciousness of clinical signs in determining whether a patient is to be considered an arrested or a cured case of tuberculosis. He states that many of these patients formerly considered cured but who since gave positive fixations, have developed symptoms. He obtained the highest percentages of cases in active infections in the moderately advanced class of patients, totaling 98.3 per cent. of those examined. Inactive cases gave 67.7 per cent. fixation and over 80 per cent. of these individuals he claims have relapsed clinically. In the far advanced cases his results are 96.4 per cent. positive fixations as compared with 96.7 per cent. in the moderately advanced, and 98.3 per cent. in the incipient cases. He claims that the method is of distinct clinical value, and does not give fixation with clinically non-tubercular or syphilitic sera. The most encouraging results, however, are those reported by Miller, who in conjunction with Zinsser, has employed an antigen prepared by triturating living or dead bacilli with dry crystals or ordinary table salt and then adding distilled water up to isotonicity. Although many antigens have given favorable results, Miller considers that the antigen they have reported is superior to the others in use, because it has failed in their hands to give cross-fixation with luetic sera, has usually been negative in arrested cases, and has been almost invariably positive in active cases. It seems also to be one more easily prepared.

It is seen, therefore, that efforts at the recognition of complement fixing bodies have been directed first against those produced by the whole bacillus, then by tuberculins, then by split products of the tubercle bacillus, and finally by what is called tissue antigens. A fairly complete summary published by Miller showed that the latter group when prepared minus tuberculins gave uncertain results. Where tuberculin was used there was also a margin of error which rendered the test of doubtful value. The antigens made up of bacillary suspensions also gave good results but a few observers have reported positive fixations with clinically arrested cases. The antigens made up of split products gave non-specific fixations with normal non-tuberculous individuals.

It is not necessary to recapitulate all of the results obtained. It suffices that up to the present time the best results have been reported with the antigens of Calmette and Massol, which con-

tain endobacillary substances extracted by water and peptone water, the tuberculin of Besredka, which is the filtrate of an excellent culture medium for tubercle bacilli, but which is not always specific, and the salt extracts of Miller and Zinsser, as well as the alcoholic extracts of Craig. In addition Petroff has prepared antigenic substances of bacilli grown on his gentian violet medium which he has separated into a lipid and protein fraction which he claims gives satisfactory results. This is quoted in an article by Webb in the February number of the Journal of Laboratory and Clinical Medicine, who concludes also that the antigens of Calmette and Massol and those of Miller and Zinsser have proven reliable in cases carefully controlled by clinical diagnosis and by X-ray plates. In the last article published by Miller in the J. A. M. A. he gives the results of observations made upon 1000 cases. They were as follows: 284 cases of pulmonary tuberculosis gave positive reactions in 275, and negative in 9. Second, non-tuberculous and normal patients react negatively 144 cases; 243 Wassermanns all negative except 7, and in these 7 tuberculosis was established in 5 and not excluded in the other 2. The test was negative in arrested and in negative cases. Of 113 tested, 103 were negative and 10 positive. As a result of his studies he believes that there are cases of tubercle bacillus carriers and that the expectoration of tubercle bacilli is no indication of the activity of the disease.

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## DEPARTMENT OF PHARMACY AND CHEMISTRY.

Edited by FRED I. LACKENBACH.

(Devoted to the advancement of Pharmacy and its allied branches; to the work of the Council on Pharmacy and Chemistry of the American Medical Association, and to matters of interest bearing upon therapeutic agents offered to the medical profession. The editor will gladly supply available information on subjects coming within the scope of this Department.)

### NEW AND NONOFFICIAL REMEDIES.

Since publication of New and Nonofficial Remedies, 1917, and in addition to those previously reported, the following articles have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion with "New and Nonofficial Remedies":

Tablets Sodium Chloride and Citrate-Squibb (Dr. Martin H. Fischer).—Each tablet contains sodium chloride 1 gm. and sodium citrate 2 gm. E. R. Squibb and Sons, New York.

Optochin.—Ethyl-hydrocupreine.—A synthetic alkaloid closely related to quinine. It has the antimalarial and anesthetic action of quinine, but toxic symptoms, such as tinnitus, deafness, amblyopia or amaurosis (retinitis) are more liable to occur than with quinine. Investigations indicate that the drug may be of value in the treatment of lobar pneumonia, when its safe dosage has been determined.

Reports indicate that the drug is of decided value in the treatment of pneumococcic infection of the eye (ulcus corneae serpens). Optochin is insoluble in water, but may be used in 1 to 2 per cent. solution in a bland fatty oil or as an ointment. Merck and Co., New York.

**Optochin Hydrochloride.**—Ethyl-hydrocupreine hydrochloride. The hydrochloride of optochin (see above). It has the therapeutic properties of optochin, but is soluble in water. For application to the eye and instillation into the conjunctival sac a freshly prepared 1 to 2 per cent. solution in water is used. Merck and Co., New York. (Jour. A. M. A., March 3, 1917, p. 713.)

#### ITEMS OF INTEREST.

**Effect of Opium Alkaloids on the Ureters.**—According to D. I. Macht morphin and the opium alkaloids having a similar constitution increase the contraction and produce a greater tonicity of the ureter, whereas papaverin and the opium alkaloids constituted similarly produce a slowing or total inhibition of the contraction and relaxation of the tonus. In opium and pantopon, which contains the total alkaloids of opium, the effect of the morphin group preponderates. Ureteral colic is due to spasmodic contractions of the ureter caused by the irritating calculus and hence the use of papaverin or opium is more rational than that of morphin. Furthermore, the slighter toxicity of papaverin, its tonus lowering power and its local analgesic properties suggest its local application in spasmodic conditions of the ureter. (Jour. A. M. A., March 3, 1917, p. 719.)

**Dating of Biologic Products.**—For the protection of the consumer as well as the manufacturer, the Council on Pharmacy and Chemistry has adopted a rule requiring that serums and vaccines and similar products to be accepted for New and Non-official Remedies must bear on its package the date of its manufacture in addition to the date required by federal law. The practice now followed by manufacturers of placing on the containers of biologic products the date beyond which these agents are not to be regarded as dependable (though in accordance with the federal law) has not been satisfactory. Except for diphtheria and tetanus antitoxins, in general there are no methods for determining the potency of serums and vaccines. At the present time, for the same material, one manufacturer will fix an expiration date of four months, others one year or even eighteen months. Obviously this lack of uniformity is unfair to the manufacturer who endeavors to supply a product as fresh as is commercially practicable and it also may lead the physician to form a false opinion regarding the potency of certain biologic products. The new rule of the Council will enable the physician to know the age of a given product when it reaches him and will permit him to judge whether or not it has been kept unduly long. Moreover, it will prove not only helpful to the conscientious manufacturer and the physician but will also safeguard the patient. (Jour. A. M. A., March 3, 1917, p. 728.)

**Another Shortage of Salvarsan.**—The indications are that the supply of salvarsan and neosalvarsan in this country has again reached the point of exhaustion. Congress, which made our patent law, has the power to suspend the patent on any preparation that the patentee is unable to, or does not supply, when such suspension is in the interest of public health, and it should suspend the salvarsan patent. In the meantime it is to be hoped that the Dermatological Research Laboratory of Philadelphia will again supply the product as it did during the previous salvarsan shortage. (Jour. A. M. A., March 10, 1917, p. 785.)

**Control of Intestinal Bacteria.**—A recent investigation indicates that the direct feeding of bacterial

cultures of lactic acid-producing organisms had almost no influence on the intestinal flora. On the other hand the administration of milk sugar (lactose) brought about a marked change in the intestinal flora. It appears therefore that the beneficent action of milk cultures is dependent on the lactose and not on the bacteria which they contain. (Jour. A. M. A., March 24, 1917, p. 918.)

**Active Principle of Leeches.**—The principle in the buccal secretion of the leech which prevents the clotting of blood is herudin, a deuterio-albumose. (Jour. A. M. A., March 24, 1917, p. 931.)

**Betaine Hydrochloride.**—It contains 23.8 per cent. absolute hydrochloric acid and 8 grains corresponds to about 18 minims of diluted hydrochloric acid. In solution betaine hydrochlorid dissociates into hydrochloric acid, but it is not so efficient in aiding the action of pepsin as an equivalent amount of hydrochloric acid. (Jour. A. M. A., March 24, 1917, p. 931.)

**The Sargol Case.**—The exploiters of Sargol, the get-fat-quick nostrum, were found guilty of fraud and were fined \$30,000 after promising that the business would be discontinued. Sargol was made by Parke, Davis and Co. at a price of 53 cents to 78 cents per thousand tablets. Sargol was stated to contain extract saw palmetto, calcium hypophosphite, sodium hypophosphite, potassium hypophosphite, lecithin, extract nux vomica. The trial is said to have cost the United States over \$100,000. Although the business was palpably fraudulent, although the claims made for the nostrum were palpably false, the defendants were able to employ physicians to go on the stand and swear that Sargol was a "flesh builder" and "bust developer." (Jour. A. M. A., March 24, 1917, p. 927.)

**Succus Cineraria Maritima.**—In agreement with the report of the Council on Pharmacy and Chemistry holding the claims made for Succus Cineraria Maritima (Walker) unfounded, the federal government charged that the claim that by dropping this preparation into the eye cataract may be cured was false and fraudulent. In February 1916 the Walker Pharmacal Company pleaded guilty. Since the government's prosecution, brought under the Food and Drugs Act, affects only the claims made on the trade-package of a preparation, the admittedly false claims were still made in circular letters sent to physicians as late as October, 1916. (Jour. A. M. A., March 17, 1917, p. 864.)

**Rheume Olum.**—The Council on Pharmacy and Chemistry reports that Rheume Olum (The Rheumeolum Chemical Co., Seattle, Wash.), is said to be composed of camphor 7 per cent., chloral hydrate 7 per cent., menthol 2½ per cent., methyl salicylate 25 per cent., oil cajuput 2½ per cent., oleoresin capsicum, lanolin, white wax, "q.s." The Council found Rheume Olum unacceptable for New and Nonofficial Remedies because the amount of the potent oleoresin of capsicum was not declared, because unwarranted therapeutic claims were made, because the name was nondescriptive of its composition and therapeutically suggestive and because the fixed formula was considered irrational. (Jour. A. M. A., March 17, 1917, p. 865.)

**Ichthyar.**—The Council on Pharmacy and Chemistry reports that Ichthyar was submitted by the Szel Import and Export Company with the claim that it was essentially similar to ichthyol in composition and superior to it in therapeutic properties. The statements that were submitted regarding its composition made it impossible to determine whether or not it was similar to or identical with ichthyol. No evidence was furnished in regard to its therapeutic value. On the basis of the available information the Council held the claims regarding composition and therapeutic value unsubstantiated and ichthyar ineligible for New and Nonofficial Remedies. (Jour. A. M. A., March 10, 1917, p. 796.)

**NEW AND NON-OFFICIAL REMEDIES 1917.**

New and Nonofficial Remedies, 1917, contains descriptions of the proprietary and unofficial medicaments which the Council deems worthy of recognition by the medical profession. Every physician who desires to further the cause of scientific prescribing, who is anxious to see this country purged of the blight of the nostrum, and who desires to aid in diminishing the domination of commercialism in therapeutics in this country should have a copy of this book for ready reference.

**The Annual Reprint of the Reports of the Council on Pharmacy and Chemistry,**

for 1916, contains the reports of the Council which were adopted and authorized for publication during 1916. It gives the reason why preparations which have been considered by the Council were admitted to New and Nonofficial Remedies. It also explains why certain preparations included in previous volumes are not contained in the latest (1917) edition of New and Nonofficial Remedies. Up-to-date physicians should possess the Annual Council Reports, as well as New and Nonofficial Remedies.

New and Nonofficial Remedies will be sent post-paid for \$1.00 and the Annual Council Reports for 50 cents, by the American Medical Association, 535 North Dearborn street, Chicago.

W. A. PUCKNER, Secretary,  
Council on Pharmacy and Chemistry.

**THE APRIL MEETING OF THE STATE BOARD OF HEALTH.**

The regular meeting of the State Board of Health was held in Sacramento, April 7, 1917. There were present: President George E. Ebright, Vice-President F. F. Gundrum, Secretary Wilbur A. Sawyer, Dr. Robert A. Peers, Dr. Edward F. Glaser and Dr. Adelaide Brown.

President Ebright, Chairman of the Committee on Public Health and Hygiene of the State Defense Council, presented a report, outlining the work that must necessarily be undertaken by the various bureaus of the State Board of Health under the new State Defense Act. Dr. Ebright placed special emphasis upon the importance of the control of water supplies and sewage disposal facilities, the work of sanitary inspections, the eradication of malaria, the examination of foods, and the preparation for increased work in epidemiology. Dr. Ebright's report also touched upon the necessity of preparation for expert work in bacteriology.

The proposed five years and three months' course of training at the Lane Hospital, San Francisco, was accepted as meeting in full the requirements of the Nurses' Registration Act for an accredited training school.

The action of the Secretary in appointing Professor W. B. Herms and Mr. Stanley Freeborn of the University of California to continue mosquito survey work during the present year, without salary, was confirmed.

In accordance with the recommendation of the Director of the Bureau of Tuberculosis, the Santa Clara Hospital was placed upon the list of hospitals eligible for the state subsidy.

In accordance with the recommendation of the Director of the Bureau of Sanitary Engineering, permits for supplying water to consumers were issued to the city of Lodi, the Hayward Water Company and the Marysville Water Company.

The Secretary was authorized to appoint employees of municipalities and public service corporations as inspectors of the State Board of Health for the purpose of patrolling watersheds under the direction of the Bureau of Sanitary Engineering.

More than one hundred food and drug cases next came before the board and were passed upon.

W. A. SAWYER, Secretary.

**NEW MEMBERS.**

Abbott, P. F., Oakland.  
Devine, C. T., Oakland.  
Harbeck, Chas., Hayward.  
Hanley, Jas. C., Hayward.  
Smith, A. C., Oakland.  
Shade, M. A., Oakland.  
Johnson, Edwin E., Concord.  
George, W. S., Antioch.  
Deissinger-Keser, M., Richmond.  
Fraser, W. W., Richmond.  
Vestal, Hall, Richmond.  
Breneman, J. T., El Cerrito.  
Martin, Wallace P., Fresno.  
Christal, Chas. H., Eureka.  
Bittner, C. L., Sacramento.  
Crawford, J. W., Sacramento.  
Hale, Nathan Geo., Sacramento.  
Lyman, Timothy, Sacramento.  
Munger, Arthur Lee, Jr., Sacramento.  
Zimmerman, Harold, Sacramento.  
Evans, H. R., Trona.  
Strong, D. Chas., San Bernardino.  
Feddickord, Harper, Fort Bragg.  
Stout, Geo. W., Ukiah.  
Liftchild, Judson, Ukiah.  
Gordon, S. B., Salinas.  
Davis, W. W., Brea.  
Boyd, J. P., Santa Ana.  
Ryan, L. M., Banning.  
Green, Jonathan, San Francisco.  
Tavlopoulos, Jno. N., San Francisco.  
Casper, Ervin J., San Francisco.  
Hurwitz, Samuel H., San Francisco.  
Smithwick, J. M., Byron Hot Springs.  
O'Neill, A. A., San Francisco.  
Tobner, Oscar, San Francisco.  
Thomas, R. W., San Diego.  
Dunlop, Florence, San Francisco.  
Fife, Joseph, San Francisco.  
Cookinham, F. H., San Francisco.  
Harvey, Richard W., San Francisco.  
Green, Jonathan, San Francisco.  
Eude, F. Macbeth, Pasadena.  
Hall, Wm. Ethelbert, Los Angeles.  
Littlefield, E. W., Los Angeles.  
Morrison, W. A., Los Angeles.  
Stookey, Byron, Los Angeles.  
Zarraga, Fernando, Los Angeles.  
Rumwell, M. E., San Francisco.  
Parsegan, J. E., San Francisco.  
Fujimori, N., Los Angeles.  
Johnson, C. A., Los Angeles.  
Lettice, Fred E., Los Angeles.  
Newcomer, Paul W., Los Angeles.  
Bishop, F. C., Los Angeles.  
Friedman, Maurice, Los Angeles.  
Jesbery, Simon, Los Angeles.  
Campbell, Matthew, Los Angeles.  
Boonshaft, Louis, Los Gatos.

**RESIGNED.**

Plincz, John K., San Francisco.

**DIED.**

Gochenauer, David, San Diego.  
Dozier, Leonard F., San Francisco.  
Parsons, Carl Gehr, Hollywood.  
Magnus, Max, San Francisco.  
Brune, August E., San Francisco.  
Richard, Henry Endicott, Oakland.  
White, John L., Sacramento.  
Horton, Theron W., Honcut.  
Elmer, Clyde Jason, Los Angeles.  
Rosencrantz, Nathaniel, San Francisco.  
Felt, Rae, Eureka.  
De Puy, Anson A., Oakland.  
Pollard, John W., Los Angeles.  
Noble, Paul B.,